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Codes of the Metal and Plating Industries

A Summary of the Work which Has Been Done in Organizing the Various Branches of the Non-Ferrous Metal and Plating Trades Under the National Recovery Act.

THE order of the day is the organization of industry into trade associations, and the most pressing duty of trade associations at this time is the formulation of codes of trade practice under which their industries are to operate.

In some fields the problem is comparatively simple. They are homogeneous and compact, like the oil or coal industries. In metals and plating, however, the wide diversity of the operations and markets has necessitated the formation of a number of associations, each with its special code to cover its special problems.

Naturally, with such a wide range of questions and so many obstacles to overcome, not all of the trades have completed their work. This article is therefore in the nature of a "progress report." At this writing many of the codes abstracted below have not yet gone through final acceptance but they are on the way. Changes may be made.

In these abstracts only the special points are given. General clauses, common to all industries (such as not setting up monopolies, not oppressing small businesses, the right of men to join such labor organizations as they see fit, etc.) appear in all codes, and are consequently taken for granted here.

Brass Foundries

The Non-Ferrous Foundry Association for Industrial Recovery has been formed to cover this industry. Executive offices are at 47 Fulton Street, New York. Officers are N. K. B. Patch of the Lumen Bearing Company, Buffalo, N. Y., President; A. B. Norton of the Aluminum Company of America, Cleveland, O.,

Vice-President; Sam Tour of Lucius Pitkin, Inc., Executive Secretary.

A code was sent in on August 24th, the details of which have not yet been released. In the meantime, a petition has been presented, asking for changes in some points of the Blanket Code so that the industry may operate under it until its own code has been approved.

Aluminum Research Institute

This code of fair competition is on behalf of the producers and manufacturers of secondary aluminum and its alloys. Headquarters are in Chicago; R. D. T. Hollowell, Secretary.

Office Help: Employees (other than factory or mechanical workers or artisans or outside salesmen or watchmen) shall not be employed more than 40 hours per week averaged over any 4-week period; provided, however, that such employees shall not be employed more than 48 hours in any one week.

Factory Help: Factory or mechanical workers or artisans shall not be employed more than 40 hours per week averaged over a 13-week period; provided, however, that such employees shall not be employed more than 48 hours in any one week; nor more than 10 hours in any one day; nor more than 16 hours in any consecutive 2 days; provided further, that time and one-third shall be paid for all hours worked in excess of 8 hours in any one day.

Minimum Wages: Factory or mechanical workers or artisans shall be paid not less than 35c per hour. The minimum rate of pay herein prescribed establishes a guaranteed minimum rate of pay regardless of whether the employee is compensated on the basis of a time rate or on a piece-work performance.

Non-Ferrous Ingot Metal Institute

This code of fair competition is on behalf of the smelters and refiners of brass and bronze in ingot form. Headquarters are in Chicago. The terms are substantially the same as for the Secondary Aluminum industry, except as follows:

Minimum Wages: Male factory or mechanical workers or artisans shall be paid not less than 35c per hour; female employees of this class shall be paid not less than 30c per hour; provided, however, that where women employees do substantially the same work or perform substantially the same duty as men employees, they shall receive the same rate of pay as men employees receive for doing such work or performing such duty. The minimum rate of pay herein prescribed establishes a guaranteed minimum rate of pay regardless of whether the employee is compensated on the basis of a time rate or on a piecework performance.

Association of Manufacturers in the Aluminum Industry

This association covers the production of aluminum from ore, the manufacture of virgin aluminum and the manufacture of alloys and aluminum and aluminum alloy products.

Wages: Southern section, 25-30c per hour minimum, depending upon type of district.

Northern section, 30-35c per hour minimum.

Piecework rates to be such that wages will be at least equal to above.

Hours: Continuous operations—42 hours per week.

Non-continuous—40 hours per week.

Minimum Age of Employees—16 years.

Copper Industry

This industry covers the production of copper from ore and the re-working of scrap.

Hours—40 hours per week.

Wages—35c per hour minimum for unskilled labor; Texas, Arizona and New Mexico, 30c per hour. Old or incapacitated employees, 80% of above, but not to number more than 5% of total. Office employees, \$15 per week minimum.

Minimum Age—Sixteen.

Control of Output: A schedule of operations is set up, allotting quotas to various operators; these to be changed as market conditions demand.

Prices: No sales below reasonable cost; cost to be the weighted average of American operations. No sales further ahead than 3 months from date of sale.

Copper and Brass Mill Products Association

The code for this association covers the manufacture of copper and brass sheet, strip, rod, wire and tube, etc. For the present, headquarters are with the American Bureau of Metal Statistics, New York.

Price Protection: The practice of giving to customers protection against advance in price and guarantee against decline is forbidden.

Minimum Ages of Labor: Eighteen years, except for clerical, laboratory and messenger help (16 years).

Wages—35c per hour minimum for males; 30c per hour minimum for females. Equal pay for same work.

Old or incapacitated employees, not less than 80%

of above; total not to exceed 5% of total employees.

Hours: 40 hours per week with certain exceptions, such as watchmen, etc.

Price Schedules: All prices to be set forth in schedules and no sales to be made at less than these schedules. Scrap prices are to be included.

No lump sum biddings; bids to be itemized.

Fabricated Metal Products Federation

This Federation is a combination of firms, corporations and trade associations engaged in the manufacture of metal products beyond the point of mill shapes and foundry operations. It is said to cover about 7,000 concerns. Headquarters are in Washington.

Hours—40 hours per week with exceptions and special allowances.

Wages—30c per hour minimum for females and 35c for males with special cases where 25c and 30c will prevail; also equal pay for females and males where the work done is the same; learners, 80% of above rate, but number of learners not to exceed 5% of total employees.

Secondary Metals Institute

This Institute is the reorganized Metals Division of the National Association of Waste Material Dealers, 1109 Times Building, New York. Details of the code follow:

No labor under 16 years of age except that persons 14-16 may be employed for 3 hours between 7 a. m. and 7 p. m. in such work as will not interfere with school work.

Hours—40 hours per week. 48 hours per week for chauffeurs, drivers, helpers, engineers; watchmen may work the average hours worked the first 6 months of 1933.

Wages—35c per hour minimum in the North; 30c per hour minimum in the South.

Zinc Industry

A code for the zinc industry has been submitted through the American Zinc Institute, 60 E. 42nd street, New York. J. D. Conover is Secretary. The industry is divided into divisions, such as Mining, Prime Western Smelting, High Grade, etc. Below are the sections of the code for the divisions which lie in our fields.

The secondary zinc division is defined to include the production of slab zinc of all grades, and zinc dust, and the treatment of zinc ashes, by plants which treat secondary materials only.

The rolled zinc division is defined to include the production of rolled plate sheet, strip and ribbon zinc.

Hours of labor—maximum, 42 hours per week average over a 13-week period.

Wages

Secondary zinc division. The minimum wage shall be at the rate of 35c per hour, except for cleaners and outside labor, for which the minimum wage shall be at the rate of 30c per hour.

Rolled zinc division. The minimum wage shall be at the rate of 35c per hour, except for cleaners and outside labor, for which the minimum wage shall be at the rate of 30c per hour.

Electroplating

Chromium Platers Guild

The Chromium Platers Guild of America, (whose organization was reported in METAL INDUSTRY for August) has drawn up a code which is being submitted for approval in Washington. Walter Plumacher, 344 E. 59th street, New York, is Executive Secretary.

In this code, among the unfair trade practices listed are:

1. Selling below reasonable cost.
2. Inducement of breach of contract between competing employers and their employees.
3. Espionage on methods of competitors.
4. Inducement of breach of customers' contracts.
5. Misbranding—Work is to be classified as (a) Higher Grade, (b) Medium Grade, (c) Customer's Specifications.
6. Commercial bribery.
7. Defamation of competitors' work.
8. Rebates, sham offsets, false recoupments, etc.; only customary trade discounts, in no case to be over 2%.
9. False or misleading guarantees.

Hours of Labor—maximum, 40 hours per week average over a 13-week period.

Minimum Wages

| | |
|------------------------|--------------|
| Platers | 60c per hour |
| Polishers | 55c per hour |
| Platers' Helpers | 40c per hour |
| Unskilled Help | 30c per hour |

Jewelry Electro-Platers Association

Those platers specializing on jewelry in Providence and the Attleboros have formed an association. They voted to subscribe to the code of the New England

Manufacturing Jewelers and Silversmiths Association, of Providence, R. I.

This code is not available in detail, but petition has been presented to the Administration asking for a 40 hour week (with allowances) and 32½c per hour for minimum wages.

United Electroplaters League

This organization of employees (platers only) has set up a code embodying the following points:

Hours: Thirty-five hours per 5-day week, overtime at 1½ times rates.

Wages: Foreman Plater, \$60 per week minimum; Assistant Plater, \$40 per week minimum; Chrome Plater, \$50 per week minimum; Platers Helpers 1st class, 5 years experience \$30 per week minimum; 2nd class, 1 to 5 years experience, \$25 per week minimum; Apprentices, \$15 per week minimum.

Disputes are to be settled by a committee composed of representatives of employers and employees.

No persons under 16 years of age to be employed.

Associated Electroplaters of Southern California

The Associated Electroplaters of Southern California, with headquarters at 1151 South Broadway, Los Angeles, Cal., has drawn up a code the salient details of which are as follows:

Production: No operations Saturday, Sunday or Holidays.

No piece work in job shops.

Hours: Seven hours per day or 35 hours per week. No overtime.

Wages: Electroplaters, 65c per hour minimum; Polishers, 65c per hour minimum; Helpers and Unskilled, 45c per hour minimum.

Pricing: Charges for work shall be not less than 2½ times the cost of all productive labor applied to the work.

Other Associations

In the field of manufacture of metal products the industries are almost legion. Space restrictions prevent covering all of them in detail but a list is given showing the spread of codes and the way industry is falling in line.

Alloy Casting, 40 hour per week; Cutlery manufacture, 40 hours per week; Lead Industry, 40 hours per week, 30-35c per hour; Porcelain Enameling, 40 hours per week, \$15 per week.

A number of other associations are working on codes. Pending their completion, many of the individual firms have accepted the NRA "Blanket Code," like the brass mills, mentioned above. Among these associations are the following:

National Association of Ornamental Iron and Bronze Manufacturers, 1772 Kessler Building, South Bend, Indiana.

Pewter and Hollow Ware Manufacturers Association, Inc., Room 1318, 11 W. 42nd Street, New York.

New England Manufacturing Jewelers and Silversmiths Association, Providence, R. I.

International Association of Electrotypers, 949 Leader Building, Cleveland, Ohio.

National Brass Association, 176 W. Adams Street, Chicago, Ill.

National Brass Institute, 229 H. W. Oliver Building, Pittsburgh, Pa.

National Galvanizing Association, 605 American Bank Bldg., Pittsburgh, Pa.

Non-Ferrous Foundry Ingot Shapes

By PIERCE BARKER

Metallurgical Engineer, Detroit, Mich.

A Complete Description of the Characteristics Demanded of Ingots for Foundry Use. Practical Reasons for the Various Shapes Used. Visual Inspection Important—Part 3*

Stacking and Piling

Ingots, bars or pigs should be of such a shape that they may be stacked or piled without trouble or danger of toppling over, and the stacks should be reasonably stable and rigid. With metals of a fairly good gravity, stacking ability is readily attained with less draft on the ingots than with the lighter metals. Heavy metals like lead may be stacked to considerable height with stability, but this is not so with aluminum which has a low specific gravity. Notched aluminum bars may be stacked to 6 or 7 feet in height, if the notches are sufficiently wide to allow the ingots to interlock. Lead pigs are readily stacked in piles and these transported without having pans for a foundation, because the pile is quite stable. Brass ingots are usually thrown into pans holding about three thousand pounds each for ready transportation and they are easily stacked for warehousing. All the ingot drawings shown indicate shapes which may be readily stacked. The aluminum steel-mill bar weighing about three quarters of a pound to one pound, is readily stacked by occasional interlocking of the notches.

metallic layer), the draft insures a close, tight fit with good, solid packing.

The ears of the ingot or pig should be large, if they are to play their part in transporting the piles without pans. If the ears are only for the purpose of facilitating removal from the molds, they may be smaller. Sometimes they are incorporated into the shape, as in Plate A, top, showing the pig of lead with ears indicated; ears on white metal pigs, such as lead, plate A, extend the full width of the ingot. Plate A, bottom, shows aluminum pig, ears added.

Plate A, shows the explanation of the terms applied to ingots, pigs and bars.

A cast ingot should be sound and free from gas holes, oxides, dross or slag and dirt, and it should not show the effect of impurity metals. The alloy composing it must possess the desired properties of composition, elongation, hardness, strength and shrinkage, and sometimes electrical conductivity, when made into the finished casting. Other things being equal, the shape of the ingotted alloy influences the condition of the metal, since bridges in the

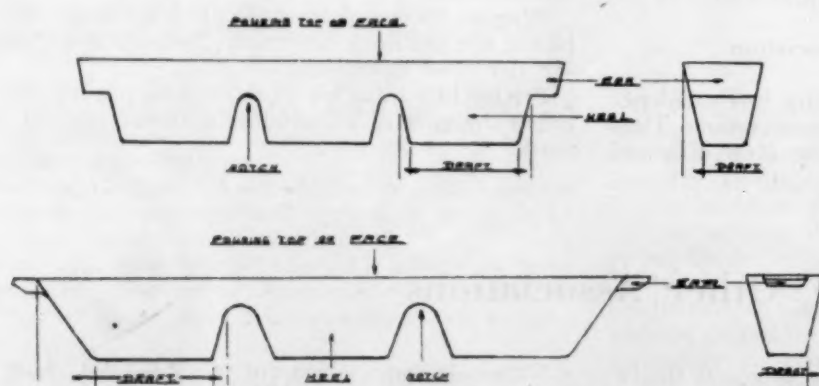


PLATE A.

Explanation of
Terms Applied to
Parts of Ingots

The face and base of ingots to be stacked must be broad enough to insure rigid setting without rocking. The notches should not indent the stock of the ingot under the face to such a point that it is easily broken in prying from the mold or in handling. Many metals like aluminum alloys and copper are hot short, and in prying them from the molds, they are easily broken at the notches. This makes stacking them difficult, and usually the broken ingots or bars must be remelted. Sufficient draft should be provided on the ingot so that when rows are laid, (with alternate ingots upside down or reversed, to form a solid

mold (for producing notches) will sometimes form a barrier, particularly in the smaller ingots, (20 pound brass ingots), which traps air during the casting, and makes a porous ingot.

A thorough inspection of a lot of metal in ingot form, includes the fracture test. Ingot manufacturers generally do not send out the metal unless true to analysis or specified formula, but the soundness of the metal structure should be examined, and a study made of the crystalline structure, to determine whether it is correct, to insure long and satisfactory service of the metal. The practice of fracturing one or more ingots from a shipment of metal,

* Parts 1 and 2 were published in our May and June issues.

will indicate the structure, and a microscopic test on a cross-section of the ingot will show the crystalline structure of the alloy and indicate the service value thereby. Hence, with the chemical analysis and the various physical tests obtainable, a complete picture of the probable service value of an alloy made to a definite analysis, is obtainable.

In order that good shapes may be produced (granted the metal is clean, etc. and poured at the correct temperature) the molds themselves must conform to the following fifteen conditions:

- 1—Draft in molds must be ample.
- 2—Mold surface must be smooth.
- 3—Metal composing molds must be of the correct mixture. Malleable iron molds have been recommended as producing better molds than cast iron, for casting some alloys.
- 4—Molds must have no sharp corners.
- 5—Edges must be rounded or bevelled, preferably one-quarter inch.
- 6—Ends should be semi-circular whenever possible, for easy removal of ingots.

7—Bridges reduced to a minimum; none in brass or bronze molds, if possible.

8—Ingots as large as possible, for manufacturing economy.

9—Molds not too deep or too long, this for minimum agitation and pouring temperature.

10—A sufficient number of molds for rapid casting, thereby keeping down mold temperature. Molds too hot make poor ingots.

11—Smoke molds (for aluminum especially) for bright ingots of good color.

12—Molds of a weight and size a man can readily handle.

13—When size permits, multiple ingots in molds for multiple pouring.

14—Thick mold wall, for long life and even temperature of wall; one-eighth to one half inch thickness of wall recommended.

15—Letters in molds to be as large as possible, with plenty of draft for easy removal of ingots.

This article will be continued in an early issue.—Ed.

Machining Aluminum

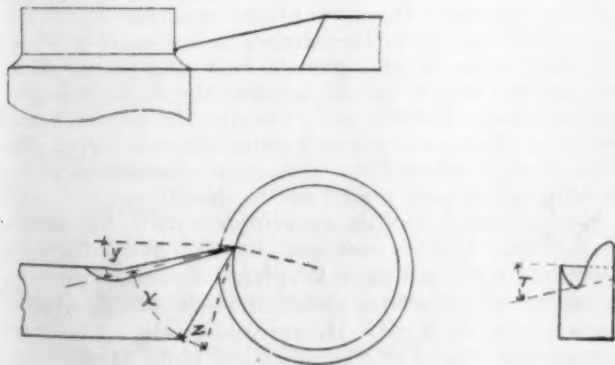
By W. B. FRANCIS

Associate Editor

TURNING (or lathe) tools must remove the chip with a shearing cut, and at the same time deliver it diagonally clear of the work and tool in a rather straight piece, instead of in short curls as with steel. In order to meet these conditions, the angle formed by the two planes that meet to make the cutting edge must be quite small. The cutting end of the tool will then resemble that of a chisel or plane bit used for surfacing wood. The application or direction of pressure of the edge is tangent, or endwise, and the top surface of the

range from 35 to 55 degrees. The top front rake angle "y" is from 30 to 50 degrees, and the front clearance, "z" from 6 to 10 degrees. There is a side top rake "t" of 10 to 20 degrees, which with the large top front rake "y" causes the chip to slide from the surface downward and sidewise, nearly straight. This action causes little friction and heat, the chip is not in such short curls, and it does not freeze to the tool.

On small work the cutting edge is set quite high, and it is well above the center on large work. These positions give a shearing cut, which is needed for producing a smooth surface, and with little friction to freeze the chip to the tool. A dished turning tool resembling the point of a teaspoon is recommended by the Aluminum Company of America for light and medium turning. It will be noted that all of these turning tools are round nosed. High-speed steel is recommended.



General Form of Turning Tool for Aluminum

tool must be nearly in the tangent line, so that the chip will clear with very little curl.

The general form of the turning tool is given in Figure 1. Its cutting edge is thinner than for other metals, and its angle, "x," for both small and large work; may

Cast Copper Anodes

Q.—We have installed a new plating works here and we would like to know if we could use copper anodes made from copper trolley wire. Our foundry has a large amount of this wire and can melt it up and pour it out in slabs for anodes. We installed a hot copper and heat it to 110 degrees.

A.—Cast copper anodes do not work well in plating solutions. Due to oxide inclusions and non-uniform crystal structure, they corrode unevenly and will look like a honey-comb. Metallics will be released and be the cause of rough work. Rolled copper should be used for anodes. The savings made by casting the trolley wire will be more than offset by the trouble that will develop.—E. E.

Just For A Day

By WALTER S. BARROWS

Toronto, Canada

The Following Lines Were Used as a Kind of Epilogue to an Address Recently Made by the Author on The Value of Electroplating to Modern Industry

LET us see how intimately we may unconsciously be associated with electroplated articles for just one day of our busy life. Take a business man for instance. (This is a possibility, not a fact.)

A chromium plated alarm clock arouses him at 7:30 A.M. He gets out of bed, sits on a contraption which is supposed to flush noiselessly and has plated hinges on the seat. He takes a few pulls at an exerciser which has plated trimmings. He turns a plated faucet and washes his face with water which flows through a plated pipe. He takes a towel from a plated towel rack and as the morning light is rather dull (it looks like rain), he presses a button which protrudes through a chromium plated switch plate and lights the electric bulbs held in an oxidized plated bracket. The soap for his bath is taken from a plated soap tray, the temperature of the bath water is regulated by manipulation of chromium plated faucet. He pares his pet corn with a knife having a plated handle. (This was a gift). Then he shaves with a plated safety razor and the magnifying mirror has a chromium plated rim as also has the sanitary case in which he keeps his shaving cream. He pulls out a few ingrowing hairs with a pair of plated tweezers; gets his toilet water from a bottle embellished with deposited silver trimmings; manicures his finger nails with a file set in a plated handle; brushes his auburn locks with a silver backed bristle brush and is satisfied he looks like a matinee idol.

Here he decides to have an eye opener and gets it from a silver plated flask. After fastening his garters with plated garter clasps he discovers that he has exhausted his supply of shirts with soft attached collars. He finds a plated collar button, then adjusts his braces. Pardon me, this fellow wears a belt. He adjusts his belt by means of a chromium plated buckle and starts a search for cuff links, but finds a pair made of sterling silver which his mother-in-law gave him for Christmas so we will omit them. He has had trouble with his feet so he puts on shoes in which are plated arch supports. I admit he puts a solid gold watch in his pocket, but the one he wears while playing golf is in a plated case fastened to his wrist. As the final adjustment he places the rhodium tie clasp securely at just the proper level and majestically struts down to the dining room. As he is not very hungry and has an exceptionally light breakfast, only a few of the plated articles usually found about a dining room are required for his needs: coffee from a plated percolator; toast made on a plated toaster; bacon and eggs prepared in a chromium plated frying pan; plated spoons, fork and salt and pepper shakers, but the

knives are stainless steel and don't count. From a plated cigarette case he takes a "Happy Thought," and behold, he lights it by use of a plated cigarette lighter. His wife gives him a kiss, informs him she is short of cash and reminds him of the fact that he will be late reaching the office. In his haste to get away he accidentally upsets the silver deposit trimmed vase on the table, nearly knocking down the oxidized copper statuette of "Apollinaris" (or was it Apollo?) from its pedestal in the hall as he adjusts his eye glasses which have a plated bridge piece. He hops into a motor car having many plated parts and drives to a downtown garage where the car is cleaned and polished during the day. He ascends to the office in an elevator having a plated cage, oxidized; opens the office door by means of a plated door knob; hangs his outer garments on plated hooks; sits down at a desk with plated equipment and rings a plated bell for his stenographer; dictates a letter, the shorthand version being made with a plated pencil and finally typed on a machine having hundreds of plated parts. He then gazes at a photograph of his baby girl which is encased in a plated frame on his desk; picks up a plated telephone and phones his wife that he will not be home for lunch; puts his feet on the desk and is lost in profound thought. Suddenly he imagines that he is beastly hungry and goes to his favorite club for luncheon and a rest. Food is served in plated dishes, eaten by means of plated scoops, shovels, etc. Then another cigarette from the plated case and lighted by the plated lighter. He shakes ashes into a plated ash tray; throws the cigarette butt at a plated cuspidor and misses it, but he ignores the fact (this gent has no time to waste on trifles). He uses a plated fountain pen to make a few notes; pays his club dues with money printed by means of chromium plated printing plates and goes back to the office.

He is reminded of an appointment with his dentist at 2. P.M., hurries out and has a cavity filled by means of tools which have plated handles, while he stares at a miniature plated derrick which dangles almost over his head. He returns to the office, buys twenty-one shares of "Who's-is-it" Gold Mine stock; telephones the Swift Electroplating Company to get the lamps off his car, silver plate the reflectors and have the job finished by the time he wants to go home. (Isn't he considerate?) He has a rotten headache. (Who cares?) He takes two aspirin tablets and then decides to go home. He meets his wife coming out as he goes in; salutation is brief and not too gushing. He tries a plated vibrator for relief of headache;

lies down and falls asleep. He dreams that he's King of the Nutty Nut Islands and wears a plated crown. He calls his nutty Jester and attempts revenge by commanding him to drink a pint of sodium cyanide solution, but wakes up and mixes a cocktail for himself, using a plated shaker for the purpose. He feels uneasy, tunes in a radio program by means of a receiving set which has many plated parts inside the cabinet. He has dinner which is served in plated dishes. He plays with his baby girl and her toys, among which are several which have plated parts. He goes to a little bridge party with his wife, plays like a booby and wins a plated booby prize. He returns

home disgusted with the results of the day and evening, lounges a while and reads a few chapters from "The Dawn of Tomorrow or Next Day" by light of a plated table lamp. He puts a favorite record on the phonograph which has a plated reproducer, tone arm, etc., winds up the nickel plated alarm clock, puts out the oxidized cat and prepares for a restful night's sleep on a twin bed having cadmium plated springs. He gets there just as the living room clock with a plated dial strikes the hour twelve—Midnight.

Now you know the value of electroplating to modern business life, though its value to modern industry may remain unexplained.

New Finishes For Metals

By C. R. BRAGDON

Ault & Wiborg Corporation, New York

CONTRARY to the conclusion which might naturally be drawn from all that we hear and read about the more extensive use of stainless steel and other non-corrosive metals which should greatly limit the field for metal finishes, that field is growing wider and using more materials, both in variety and volume, than ever before. An attempt to list the new products can give only some of the more important developments, additions to which are being made daily. Many of these developments are made possible through the use of one or another of the new synthetic resins, such as phenol-formaldehyde, glycerol-phthalate (alkyd), and other types. There is a really formidable range of them, some suited for one kind of finishing and service and some for another. For example, the phenol-formaldehyde resins excel in resistance to direct exposure to water or high humidity and to alkalis and mild acids, but some of them turn color in sun-light, and do not show quite the same staying power under exposure to all-around weather conditions. The Alkyds, on the other hand, retain color well, resist the usual climatic effects, but tend to be thermo-plastic, softening under heat, and to be swelled and disintegrated by constant high humidity or water. Other resins impart almost perfect resistance to alcohol, acids, alkalis and greases and are unusually pale in color, but lack adhesion to some metal surfaces, or require a heat-treatment for proper hardening. And so it goes. No universal product has yet been discovered. The varnish or lacquer manufacturer must study the requirements of the particular case and select the resin best suited for it.

For the plater, there are now available several new clear metal lacquers that are much superior to those of the past in color, clearness, adhesion, toughness, and resistance to acids and to spotting out. Some of these are also suitable for exterior exposure, having shown several months' resistance to sun and rain, heat and cold. But this is usually at a sacrifice of some hardness and toughness. Then there are lacquer enamels in many colors that combine firm tenacity to the metal surface with high resistance to the acids and

electric current of the plating bath, so that they may be applied to a metal background after etching and the highlights then protected with a plated chromium or nickel face. Some of these lacquers have unusual resistance to scratching.

For the metal furniture manufacturer, there are synthetic enamels and ground coats which enable rapid and more durable production of plain or wood-grained effects with a single baking, or even without any baking at all. These materials may be of either the lacquer or straight synthetic type, depending on the temperature of baking and fullness of finish required, the latter system giving a somewhat better build and being more suitable when temperatures of 225° or over may be attained.

For the metal decorator or tin-printer, there are grinding compounds for use in the making of white and colored coatings, or there are the ready-prepared coatings themselves, that have new and remarkable degrees of toughness, flexibility and resistance to chemical attack, lending themselves to the making of crowns, screw caps and other small (as well as larger) fabricated articles that have always hitherto given much trouble. Enamels, clear, translucent and opaque, for the inside of food-product cans, where freedom from taste and odor are equally important with resistance to sterilization and to the strong fruit and vegetable acids, are readily available. Tin-coating lacquers resistant to alcohol, latex lining compounds and to many other special reagents are also being supplied. Materials like these are finding use as protective coatings on the inside of steel drums, used for shipping beer and various chemical and food products. There are also numerous special finishes—crystalline, wrinkle, aluminum and what-not—which are of somewhat limited application and would take too long to list individually.

For the manufacturers of refrigerators and of imitation tile wainscoting, there are special finishes made in white and light tints that have shown resistance to humidity, greases, acids, alkalis and alcohols far beyond any other baked enamel or lacquer finish thus far known. These finishes are built up in two or three

coat work, requiring a special baking oil-base or synthetic primer; and when properly applied, they have a brilliant lustrous color that remains unchanged in light or dark, and are proof against all ordinary destructive agencies.

For the sign manufacturer, there are more durable background coatings, color pastes and clear finishing coats, adding greatly not only to the life but also to the initial appearance of the sign. The background coatings and clear finishes work well on the coating machine and the color pastes may be supplied in forms adaptable either to the paint press or the silk screen stencil process.

And so the list might be extended. Enough has been said to show the almost universal application of synthetic materials to the needs of the metal finishing trade. In general they are quicker setting and drying than oil enamels, though not so fast as lacquers; and they can in many cases be brushed, though spraying is usually recommended. They have less original solubility in ordinary thinners, particularly of the petroleum type, and usually tend to lose a good part even of this by oxidation on exposure. The recommendations of the manufacturer should be followed in the use of reducers of special type, in specified proportions, to avoid trouble. Special care should be taken to avoid leaving the enamels or lacquers stand around in partly-full or loosely-covered containers. They should always be tightly sealed in packages left as full as possible. When using from a drum and

there are a few gallons left that will not be used for a few days, it is a good practice to draw it off into kits or cans where it can be stored with a minimum air space. It is, of course, quite natural, on account of their great resistance to solvents and chemicals when applied as a film on a surface, that there should be this lack of solubility in the original enamels, etc., and this should at all times be borne in mind when working with them. But the fact that millions of gallons of such materials have been used with negligible difficulties shows that users have become educated to proper handling methods and that when these methods are followed, losses are trifling.

While the range of applications is so broad already that most new users of these new finishes will find a suitable type of formula already developed for them, some may have a brand new problem. The specialists in the field are always glad, when the prospective use is of real importance, to give special attention to its solution. In such cases full information should be supplied with regard to the type and preparation of surface, the methods of application available, the baking or other drying conditions, the application of subsequent finish coats, etc., and the conditions that the finish will be required to meet in service. With full cooperation between the finish manufacturer and the user, there are few of the even apparently impossible problems that have not yielded sooner or later to this attack.

Selective Etching Reagent for Copper and Its Alloys

By JOHN B. KASEY

Metallurgist, New York, N. Y.

AN INTERESTING and new chemical reaction has been disclosed which may be of considerable value in the microscopic examination of copper and its alloys, and, possibly, in differentiating between several natural and artificial water-insoluble copper compounds.

The reaction is one involving the solvent action of a mixture composed of ammonia water, carbon tetrachloride and alcohol on copper, varying in degree in accordance with the form which the copper is in, whether free, alloyed, or in chemical combination. The ratio of the three compounds, by volume, is as follows:

| | |
|--------------------------------------|---------|
| Ammonia water, Sp. Gr. 0.9 | 15 cc's |
| Carbon Tetrachloride | 15 cc's |
| Alcohol, 95% | 45 cc's |

Addition of the alcohol is necessary to give a miscible and clear solution.

If copper or any of its alloys is placed into such a solution, at room temperature, dissolution of the element copper begins immediately, the rate of dissolution being most rapid with the highest copper content. The solution soon acquires a deep azure blue color due to the formation of cupric ammonium chloride. The chlorine contained in the carbon tetrachloride is abstracted by the copper, and the freed carbon immediately combines to form complex hydrocarbon compounds.

The existence of chlorine in combination with the copper is shown by acidification with HNO_3 and addition of silver nitrate. AgCl precipitates in profusion. HCN compounds smelling much like horseradish, and several other disagreeable hydrocarbons are apparent on simple evaporation of the liquid or on acidification.

The selective action of this mixture for copper should prove valuable in microscopic work. Zinc is attacked also, but the action is slowed up because of copper being precipitated on its surface. Nickel and cobalt are imperceptibly dissolved. Silver is unaffected as is gold, lead, tin, antimony, bismuth. It has been observed that ignited copper oxide is attacked but exceedingly slowly. Cupric sulphide is hardly affected, while cuprous sulphide is more easily attacked than the cupric compound but much less readily than metallic copper. The reagent has additional possibilities in differentiating mineral constituents in copper ores, and in qualitative tests for copper in alloys.

A.C.B.

Correction

In our July issue, page 235, it was stated that Fred Carl who read a paper at the 1933 convention of the American Electroplaters' Society, was with the Guide Motor Lamp Company. This was erroneous, as Mr. Carl is with Delco Remy Corporation, Anderson, Ind.—Ed.

Porosity in Cadmium Coatings on Steel

By S. G. CLARKE

ABSTRACT OF PAPER PRESENTED BEFORE THE ELECTRODEPOSITORS' TECHNICAL SOCIETY AT THE NORTHAMPTON POLYTECHNIC INSTITUTE, CLERKENWELL, LONDON, E. C. 1, ON WEDNESDAY, MAY 17TH, 1933. ABSTRACT BY DR. A. K. GRAHAM, ASSOCIATE EDITOR, METAL INDUSTRY.

THE metals which are used as protective coatings for steel are usually divided into two classes, (1) cathodic, e.g., nickel chromium, (2) anodic, e.g., zinc and cadmium. The terms cathodic and anodic are convenient in indicating the electrochemical relationship to steel under many, but not necessarily all, the usual corrosive conditions under which the coatings are employed for protection. Whereas it is known that thin cathodic coatings as ordinarily applied frequently contain pores at which the steel is exposed, there is little evidence as to how far this is the case with anodic coatings.

With cathodic coatings on steel, on exposure to some conditions or corrosion, e.g., the external atmosphere, for a period insufficient to cause appreciable attack of the coating, rusting proceeds at the exposed steel at a rate which is probably accelerated by the electrochemical action which tends to be set up between the small anodic area of steel and the large cathodic area of coating available for depolarisation. Corroding conditions specially favorable to preferential corrosion of the steel base at discontinuities with the formation of visible corrosion product have been developed as porosity tests for cathodic coatings and have proved of value for inspection purposes. With anodic coatings, on the other hand, any pinholes which may be present are not readily revealed as in the case of cathodic coatings, owing to the electrochemical couple acting in the opposite direction and providing some degree of protection to the exposed steel. Consequently, anodic coatings which are apparently continuous, but which may contain pores, normally protect the steel from corrosion until some considerable attack of the coating has occurred. The protection afforded at discontinuities is necessarily provided at the expense of an increased amount of attack of the coating, and in a discussion of the probable effect of pores in anodic coatings Macnaughtan pointed out that whereas under various conditions of corrosion the attack of both porous and non-porous coatings will occur, the rate of attack will be greater with the porous coating.

This report gives an account of work carried out on cadmium coatings, as applied to steel for the purpose of protecting it from the effects of atmospheric exposure, to determine the extent to which they may contain pinholes and the importance of porosity as a determining factor in the protective life of the coatings. Such information was desired in order to estimate the value of a porosity test for inspection purposes. The investigation involved:—

- (1) The development of a porosity test.
- (2) Quantitative tests of the influence of contact with steel on the corrosion of cadmium.
- (3) Comparative atmospheric exposure tests of porous and non-porous coatings on steel.

Summary and Conclusions

A porosity test for cadmium coatings on steel has been developed which depends on immersing the specimen, from which all greasy matter has been removed, for a few minutes in dilute hydrochloric acid (1 per cent.), and noting the formation of hydrogen bubbles which occurs at discontinuities. The test is non-destructive of the coating. It has been found that cadmium coatings deposited from cyanide plating solutions of the usual composition on rolled steel of good commercial quality are ordinarily substantially non-porous, even when of extreme thinness (e. g., 0.00005 inch). In the early stages of use of the solutions, however, deposits may be produced having a considerable degree of porosity; the porosity in this case diminishes with increase of thickness, but may still be appreciable with deposits 0.0002 to 0.0004 inch in thickness. On a base of machined cast steel, porous deposits of a substantial thickness (0.0003 inch) have been produced under conditions which resulted in non-porous deposits on rolled sheet steel.

The effects of porosity and discontinuities in cadmium coatings on steel under conditions of outdoor exposure and exposure in a Stevenson screen have been studied (1) by determining the influence of contact with steel on the rate of corrosion of cadmium, and (2) by carrying out tests of cadmium coatings of varying porosity and thickness on steel; the corrosion in each case was estimated by visual and gravimetric methods. It was found that porous or discontinuous coatings are attacked at a more rapid rate than continuous coatings, and the factors deciding the degree of acceleration would appear to be the total area of steel exposed at the discontinuities and the severity of the corrosive conditions. With highly-porous and very thin coatings (0.0001 inch), the effect of pores in accelerating the attack of the coating was marked, but with the lower degree of porosity found with coatings of good commercial thickness (say, 0.0003 inch and upwards) the effect was relatively slight, as compared with the corrosion of sound deposits. The effect of exposed steel would appear to be the greater the more severe the corrosive conditions, as judged from exposure outdoors and under the milder conditions prevailing in a Stevenson screen. On atmospheric exposure, the sacrificial protection afforded to exposed steel is slight but sufficient to protect from rusting tiny areas of exposed steel, such as at pores; at small areas which are just visible to the naked eye partial protection would appear to be afforded, but at larger areas rusting tends to proceed. It may be concluded that slight porosity in a cadmium deposit is unlikely to affect its protective properties under ordinary conditions of use to an appreciable extent, but where pores are "very numerous" a lower degree of protection than that afforded by a sound deposit of similar thickness may be anticipated.

Electroplating Generators

By CHARLES J. SCHWARZ

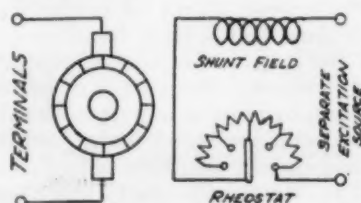
St. Louis, Mo.

A Series of Articles on the "Cornerstone of the Plating Plant." Part 4.*

The terms "separately excited shunt" and "separately excited compound" are generally employed today to designate:

1. A generator whose fields have a single winding like the shunt generator except that the winding in this case is excited from a separate source.
2. A separately excited compound generator having its shunt winding excited from a separate source and its series winding excited by the current drawn from the generator. Figures 10 and 11.

Fig. 10.
Separately
Excited Shunt
Generator



The principal advantages of the separately excited shunt generators are:

1. Machines always and immediately generate upon application of the exciting current.
2. Machines do not reverse under the influence of a counter electromotive force.
3. Machines are easily reversible.
4. Simple fields that are easily constructed with conductors of reasonable size, carrying a relatively

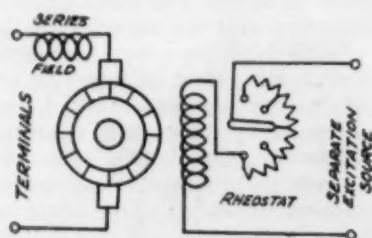


Fig II.
Separately
Excited
Compound
Generator

small current under moderate pressure generally 115 or 230 volts.

5. Machines permitting the use of commercially standardized field rheostats that are small, easily operated and cheap.
6. Light conductors between field rheostat and generator.
7. Regulation that is much better than self excited shunt machines because the voltage of the excitation is constant.

A field rheostat is commonly used to compensate for the drop in voltage due to heating and may be used also to compensate for the small drop due to

*Parts 1, 2 and 3 were published in our issues for June, July and August, 1933.

the armature internal resistance and reaction. The separately excited compound generator has the same advantage over the self excited compound machine as the separately excited shunt generator has over the self excited shunt machine.

Because the drop of voltage with increasing load is less in the separately excited shunt generator than in the self excited shunt generator fewer series ampere turns will be required in separately excited compound machines.

It is a well known fact that in generators not provided with commutating poles or compensating windings the neutral commutating zone shifts as the load in amperes increases on account of the armature reaction.

It is also a matter of common knowledge that the best means to reduce that shifting is to keep down the ampere turns on the armature which cause the distortion and at the same time to stiffen the fields resisting that distortion by providing them with a powerful magnetomotive force produced by a large number of ampere turns.

In a well designed generator of any of the above mentioned types sparkless commutation will be secured with low contact drop brushes at any output between no load and full load provided the generator is operated at its full rated voltage.

Because, admitting that the generator is correctly designed the proportion between the distorting current in the armature and the current in the fields opposing that distortion have been carefully calculated to obtain that result.

Should it be desired to operate a separately excited shunt generator for instance at one half its rated voltage and full rated ampere capacity commutation troubles are to be expected because the distorting current in the armature is the same, depending only on the ampere output and not on the volts generated; on the other hand in order to reduce the voltage generated one half it has been necessary to reduce the current in the fields resisting that distortion far more than one half.

Therefore all generators not equipped with commutating poles or compensating windings should be operated near their rated voltage at least at full load.

Auxiliary Poles, Commutating Poles, Interpoles

Commutating poles or interpoles are auxiliary poles placed midway between the main poles for the purpose of securing perfect commutation under any voltage or amperage condition within the range of the machine.

A well designed commutating pole type generator will commute perfectly from zero amperes to 50%

above its normal rating in amperes not only at its rated voltage, but at the highest voltage the machine can produce and also at any voltage below normal with the fields weakened until only enough excitation remains to cause the desired current to flow through a measuring shunt short circuited across the terminals; the brushes being located and locked at the neutral point in such a manner that the identical results are obtained when the generator is run in the reverse direction.

The commutating pole maintains the commutation zone stationary, insures satisfactory commutation with fixed brushes which permits solid bus bars to be clamped solidly and permanently direct to the brush rigging terminals, thus doing away with flexible leads, insuring the rigidity of the brush supports, reducing the number of joints, always undesirable in the transmission of heavy currents, especially so at low pressure.

The commutating pole in combination with separate excitation provides a generator of great flexibility. Let us take, for instance, a 5000 ampere, 12 volt generator; we have a right to expect perfect commutation up to 7500 amperes not only at 12 volts, but also at 9, 6, 3, and even lower, the speed remaining the same and these results being obtained instantly by adjusting the field rheostat.

Because the brushes are set at the neutral point, there are no demagnetizing ampere turns as would be the case in an ordinary machine with the brushes shifted to improve the commutation: the result is better regulation. In fact, the regulation of a well designed commutating pole type separately excited generator is practically equivalent to the voltage drop due to the resistance of the armature, commutating poles, brush riggings and bus bars with the added voltage drop from the brushes to the commutator and vice versa, it should not exceed 15% at 6 volts measured as follows: the generator being driven at constant speed (by a synchronous motor, for instance), the excitation is adjusted to cause the rated number of amperes to flow at 6 volts through a suitable resistance. Opening the connection to the resistance will cause the current to drop to zero and the rise in volts will show the percentage of regulation. Should the rise be from 6 volts to 6.90 volts, the rise is evidently 15% of 6 volts; should the rise be from 6 volts to 6.72 volts, .72 volts is evidently 12% of 6 volts.

Such test should be made first with the machine running right hand direction, then immediately run-

ning left hand direction for the following reasons: if the brushes are not exactly at the neutral point the regulation will be better in one direction than in the other, but the sum of the regulations will be practically identical. For instance, if we adjust the load of a generator so that it will deliver its full rated amperes at 6 volts in the right hand direction, then remove the load, bringing the amperes to zero and the voltmeter rises to 6.60, we will have a 10% regulation. If the machine is now reversed, nothing being changed and the same number of amperes flow through the same resistance at the same voltage, we can be pretty sure that the brushes are at the neutral point and that when we open the circuit bringing the amperes to zero we will have the same regulation and the voltmeter will go to the same point—6.60 volts. If now we shift the brushes until we get a regulation of 5% in one direction, we will get a regulation of approximately 15% in the opposite direction, because our brushes are no longer at the neutral point. It will be found that the generator will spark with fewer amperes in the direction in which it has the best regulation than in the direction in which the regulation is not as good as normal.

It will also be found that with the same brushes, the commutator will show a greater rise in temperature when operated with the brushes off the neutral point and when for the purpose of obtaining better regulation, a compounding effect, the brushes are shifted sufficiently as to necessitate the use of higher contact drop brushes, the rise in temperature will be found noticeably higher.

The commutating poles are for the purpose of securing sparkless commutation: when better regulation than is obtained with the separately excited shunt wound commutating pole type generator with brushes set at the neutral point is desired, a light series winding over the main poles or a voltage regulator is the correct solution.

Some fundamentals underlying the design of plating generators will be discussed in the next paper.

Correction

In the article on Electroplating Generators in our August issue pages 268-270, an error occurred in the captions to the illustrations. Figure 8 on page 269 should have been described as the characteristic graph of an under compound generator, while figure 10 on page 270 represents a characteristic graph of the flat compound generator.

Discussion on the Subject of Electroplating Generators

To the Editor of METAL INDUSTRY:

The articles on the subject of electroplating generators, by Mr. Charles J. Schwarz, which are currently appearing in your magazine, should be of interest to your readers. However, some of the conclusions drawn, are in our opinion, misleading. Referring to the article in the July issue, we note that the writer attempts to make a case for the "slow speed" machines, as compared to the "high speed" machines. By referring to "high speed," we naturally assume that RPM is meant. In designating an electroplating generator as "high speed," because it is driven at let us say, 600 RPM instead of 300 RPM, the author is introducing an argument which though fre-

quently employed by salesmen, as a talking point to convince their customers that a particular generator is superior merely because of this "low speed," nevertheless, from the standpoint of technical considerations and practical performance, has very little to do with the successful operation of an electroplating generator.

It should be noted that the speed of a commutator is considered not from the standpoint of RPM, but rather in feet per minute.

It will be interesting to note the practice of various manufacturers in this matter of commutator speed. Some electroplating generators operate with commutator speeds as low as 1500 ft. per minute. With

modern design, and methods of construction, and the use of steel of high tensile strength, hard drawn copper bars, properly designed brushholders and of course of particular importance, the proper electrical design of the entire machine, involving such factors as properly designed interpoles, accurately machined parts, generators today are being introduced with commutator speeds of from 2000 to 3000 ft. per minute. Note what one large manufacturer says in the matter of commutator speeds:

"The information on commutator speeds requested in yours of January 14th on the 500 KW, 60 cycle converter, is 6280 ft. per minute, dia. 20", face 17" for the 275 volt machine, and 5500 ft. per minute, 17½" dia., 15" face for the 600 volt machine.

"Briefly, our commutators operate at surface speeds up to about 6500 ft. per minute, but the more general average is around 5000 ft. per minute, and may be as low as 2000 to 3000 ft. per minute for engine driven generators.

"Commutator diameters may be anything up to about 12 ft. and faces up to 3 ft. in length. For a single pair of clamp rings 30" length is about the limit. For longer commutators, we would either use shrink rings or build them in tandem form, i.e., each bar having 2 sections connected by a flexible strip."

We should consider the reason for the abnormally low speeds, both in RPM and feet per minute, which were employed in early designs of plating generators, and which are apparently in the minds of some, still required in modern day generators. The older generators of course, were not interpole type, and that one factor probably had more to do with the necessity for abnormally slow speed, and the use of an excessive amount of material, than any other single factor. Furthermore, copper gauze brushes were thought to be a necessity for the carrying of heavy currents, and in fact they were required because suitable copper graphite brushes had not been developed.

By building generators which were huge machines for the relation between KW output and bulk, and operating them at low speeds, it was possible in the early days to build generators which would operate successfully after a fashion. However, it is a well-known fact that the commutator and brush wear was excessive, efficiency low, and cost high. Even at that, some of these old type generators did function to the satisfaction of the user, and it is interesting to note in the July issue of your magazine, an advertisement by the Chandeysson Electric Company, in which they refer to a generator built in 1904, which according to the illustration, is a non-interpole machine with copper gauze brushes and cast iron frame. It is safe to assume that a modern type generator of the same weight as the generator referred to, would have an output of probably two to three times the capacity of that old style generator.

We do not feel that it is fair to becloud the issue in the minds of the user by introducing such factors as "high speed," "current density in brushes," and other similar irrelevant talking points, often introduced by salesmen, who although they may be experts in matters pertaining to electrochemistry, usually are totally ignorant of the requirements of a properly designed electroplating generator. An electroplating generator that will function successfully, of light weight, relatively small dimensions, high efficiency, and low maintenance cost, can be built today by utilizing modern methods of construction, alloy steels,

hard drawn copper bars for commutators, anti-friction bearings, and with all that, a proper distribution of the material. It is not enough to make a generator interpole type. The interpoles must be of the proper dimensions and the number of coil turns must be correct and the air gaps properly proportioned, so that good commutation may be secured. If this is done, your consideration of whether the commutator speed is 1500, 2000 or 2500 ft. per minute, is of small importance, because there will be no harmful short circuit currents in the brushes which tend to heat the commutator and the brushes and produce excessive wear. One of the favorite arguments of some salesmen is to claim that the current density in the brushes, referring of course, to the line current, is 50, or 75 or 100 amperes per square inch, whichever the case may be. It is a well established fact that with improperly designed interpoles, or improperly spaced brushes or interpoles, even with line current densities in the brushes of 50 amperes per square inch, excessive brush heating will occur. This is due entirely to the local currents circulating in the brushes, originating in the armature coils undergoing commutation. It is interesting to note what can be done in this matter of "high speed" and "high current density." We point to a letter commenting on the performance of a modern type generator:

"These units are rated 2500 amperes 12 volts, 600 RPM. Due to our requirements for increased voltage and current, it was necessary to speed up one unit to 720 RPM. Under this condition, we have repeatedly subjected this generator to overloads, and for periods of from twenty to thirty minutes, have carried as much as 5000 amperes at 14 volts. Under these conditions of operation, the generator has performed splendidly, without any sparking."

It is evidence of this character that must be introduced, to determine the merits of the "high speed" electroplating generator.

M. M. Rose,

Chief Engineer

Columbia Electric Manufacturing Company,
Cleveland, Ohio.

Color Relations Among White Metals

The copper-nickel and copper-nickel-zinc alloys, usually considered in the single group of "white metals," actually give a rather wide variation in color. This problem becomes an important one when it is desired in architectural construction to use cast, wrought, and extruded parts in conjunction with one another. Ordinarily each method of manufacture requires its own individual compositions. This means that judicious choice of compositions must be made in order to attain a pleasing harmony of color.

Some work on this problem is being done at the Research Laboratory of the International Nickel Company. It has been found that some of the metals are distinctly bluish, others tinted yellow, still others with pink, and some are grayish. These colors are purely relative, and the differences in color are not perceptible in many cases until the metals are placed in juxtaposition. By careful comparison of 90 compositions it has been possible to group them according to these color differences.

Developments in Metals



A Mariner's Astrolabe, Used by Samuel de Champlain, French Explorer, Pioneer and First Governor of French Canada, in His Explorations. It is Made of Brass.

This Is a Persian Astrolabe. This Type Is of Hollow Brass, and Contains Four Thin Brass Discs Called Tables or Climates on Which Are Skillfully Engraved Curious Mathematical Symbols and Different Latitudes.



The Astrolabe—An Unusual Brass Product of Olden Times

BRASS is indeed a metal of the ages, and in further evidence, we are giving here an abstract from a very interesting article, "All About Astrolabes," which appeared in the July, 1933, number of "The Lookout," issued by the Seamen's Church Institute of New York, by whose courtesy the illustrations here are reproduced.

The astrolabe, it says, is not a zoological specimen, as many would be inclined to guess from the name. It is an instrument usually made of brass, which was used centuries ago, mainly by mariners, astronomers, and desert tribes, to determine stellar, solar and lunar altitudes. It preceded the compass and sextant as an aid to direction and position finding. The Arabs used it (some still do) to make certain they were facing Mecca when praying on the desert wastes. Astrolabes were used by Columbus, Captain John Smith, Samuel de Champlain. The first authentic book on the astrolabe was written by Chaucer in the Middle Ages. The use of the astrolabe involves certain geometrical principles, but its inaccuracy nevertheless caused Captain John Smith to arrive at Virginia rather than New England where he intended to land.

A collection of over 40 astrolabes possessed by Samuel V. Hoffman inspired the article referred to above. The specimens illustrated are from this collection.

Gar Wood Using Monel Shafts

MONEL metal shafts for Gar Wood's Harmsworth Trophy defender, Miss America X, showed a high range of physical properties, The International Nickel Company, New York, reports after final laboratory tests. Some properties of the shafts, which are $1\frac{5}{8}$ " diameter, 10' 4" long, are: breaking strength, 110,000 lbs; yield point, 100,000 lbs./sq. in.; elongation, 18% in 2" and reduction of 60% in area. This is said to be the first nonferrous material to be used where such tremendous power is involved, each shaft being required to transmit 3170 h. p. Monel metal propellers will also be used on the boat.

Building Up Patterns with Linoleum

OFTEN, when it is necessary to change a pattern slightly, considerable expense and time may be saved by building it up with scrap linoleum to the required dimensions rather than making a new pattern. Many patterns needing a slight change in diameter are easily changed in this manner.

Changes necessitating building up of the pattern are encountered when it is desired to cast a metal from a pattern designed for another metal, as in casting brass from a pattern designed for iron. Also, for example, when it is desired to make a gear with an additional tooth from a standard pattern, linoleum is very useful.

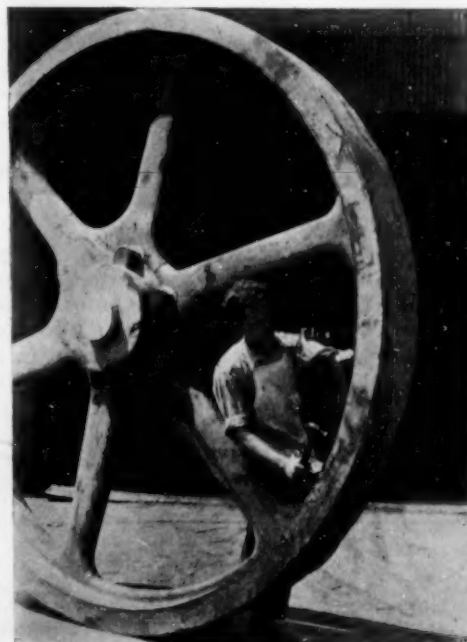


Illustration Showing the Use of Linoleum on a 120 Inch Forming Press Gear Pattern at Plant of the Westinghouse Electric and Manufacturing Company.

EDITORIALS

Work and Play

IN the year 1929, the total value of the important raw metals produced in the United States was about \$1,500,000,000. During approximately the same period according to a recent newspaper report, the American people spent over \$10,000,000,000 for recreation. The almost unbelievable difference between these figures leads one to analyze them more closely, if not actually to suspect their accuracy.

The important metals include pig iron, copper, zinc, tin, lead, aluminum, nickel, mercury, silver and gold. That is comparatively simple. But what is meant by "recreation"?

According to the book entitled "Americans at Play" by Dr. J. F. Steiner, "play" includes automobiling, motion pictures, radio, competitive sports, travel, indoor games, flying, boating, theatres, night clubs, amateur photography, reading, music and an almost unlimited number of individual forms of recreation under these main headings. Dr. Steiner's figures also point to the conclusion that there has been a strong trend away from the simple pleasures to the more expensive ones. Automobiles replaced bicycles; canoes gave way to motor boats; golf with many, took the place of walking.

A glance at some of these items explains the huge total. Automobiles and travel accounted for over half of the total—about \$6,500,000,000. Movies, theatres, night clubs and radio took \$2,200,000,000. Also it must be remembered that these figures are retail prices; they include vast quantities of raw materials, fabricated, assembled and distributed. Metals are raw materials, the first stage. There is a vast difference in price between a pound of copper just out of the refinery and the same pound of copper in a tea kettle in a kitchen.

That our bill for recreation is huge, there is no doubt; nor is it reprehensible. That depends entirely upon the form of recreation; for example, books vs. night clubs! It has without question been severely cut during the past four years, but it may rise again if the shortened hours of labor become permanent. We can only hope that the newly acquired leisure hours may be spent wholesomely.

Up to Date Market Data

NEW times bring new faces and new facts. When conditions change, old conclusions and methods are useless. They only mislead.

The past four years have seen a succession of new times—each worse than the one before—until the last

few months which have brought improvement, but also uncertainty. Now is perhaps the time to push business forward. But where and how? Old lines may be out of date. Old connections have been broken; old purchasing agents and sales managers, replaced by new; old concerns merged or split up.

It is safe to say that no mailing list that has not been rigorously combed has any value. No line of products that has not been carefully scrutinized and checked against markets and competitors' products, is up to date.

We are in the midst of greater changes than we have yet seen. It behooves every manufacturer of metals and metal products to take stock. We have new alloys digging into old ones. We have new machinery which makes old equipment obsolete. We have lost old customers and must find new ones. Our old accounts have new faces at old desks. Our old market data is in a fair way to be useless.

But every firm that is still alive has salesmen. Let these salesmen add a new line to their collection of samples—investigation. They must not only sell; they must find out what is the state of their market. Are new competitive products appearing? Report it quickly. Are old products losing popularity? Discover why. It may be more than dull business. It may be replacement by other items—better or cheaper.

Now as never before, it is necessary to know the state of markets and of developments in industry.

Scrap Vs. New Metal

WITH industry beginning to swing upward, it is only natural for us to look ahead of the present moment and peer into the future. What is the outlook for the use of metals?

One of the vital factors in this problem was discussed in the report of President Hoover's Research Committee on Social Trends, which was issued in 1932. The chapter on "Utilization of Natural Wealth" points out that the recovery of scrap as a source of metal supply is of growing importance. The authors state: "With the rapid increase in the virgin metal flowing into the channels of trade, the world's stock is built up at a surprising rate. As the stock increases the tonnage of secondary or scrap metal which is reclaimed and returned to industry increases also. The accumulation has given rise to a large industry built up around the collection, classification and resmelting of scrap metal. The annual value of the secondary non-ferrous metals is \$330,000,000. The stock of secondary material modifies

the demand for the primary metal, it adds to the bargaining power of the larger consumers who are also the largest producers of scrap, and thereby helps to stabilize prices."

Since 1911, the authors state, the recoveries of scrap have increased much more rapidly than the production of virgin metal, the process having gone so far that in 1926 the secondary material furnished 38 per cent of the supply of aluminum, 35 per cent of the copper, 31 per cent of the antimony, 28 per cent of the tin, 23 per cent of the lead and 19 per cent of the zinc.

"The ultimate result of these tendencies seems clearly indicated. We are moving toward a position where the great bulk of the world's annual requirements of metal will be met from scrap. The demand for virgin metal will consist chiefly in replacing the annual loss through dissipating uses, wastage and corrosion. Obviously, such a condition is far in the future, but the tendency is unmistakable, and it suggests one of the ways by which modern society is adjusting itself to the increasing natural difficulties of mining."

That scrap is a very important factor in the metal market, there is no doubt. At the present time, however, it does not lead, but rather follows the virgin metal market. It is still not large enough to "run the show." It may be creeping up on new metal production, but the day when it will catch up is still very far off. In the meantime, with science and invention so active, no one can predict very far ahead. There is no way of knowing what new industry will arise to use metals, or what old industry will swing over to metals from other materials.

The Committee's conclusions are far sighted and valuable. They point out possibilities which should be recognized. It is more than likely however, that the recognition of these possibilities will spur metal producers to keep abreast of the times in the future as they have in the past.

Operating Under the National Recovery Act

THE National Recovery Act has provided a test of the patriotism of business. It has demanded immediate sacrifices, higher costs, without any assurance of future profits. Yet this procedure, contrary to every tenet of "good business" has been followed cheerfully by a vast number of business men, either through their trade associations or individually, under the "Blanket Code." It is an inspiring exhibition of national faith.

That their obedience to the wishes of the Administration has laid them open to dangers is common knowledge. Even the largest corporations are anxiously watching the trend. How much more difficult, then is the path of the small company, the "little business man"! He has no reserves to draw upon to cover his increased costs. He cannot raise his prices in the face of Government disapproval and customers' resistance. Where is the money coming from to meet the rising expenses?

There are two paths to be followed—parallel to each other. The first, for those in straitened circumstances is better credit facilities to enable honest, solvent and capable manufacturers to finance their increased expenses until consumption catches up with production

and provides a stimulated market. Here the banks must function. They must show their patriotism just as the manufacturers are showing theirs.

The second is improved methods of manufacture. Higher wages and shorter hours cannot possibly last without better facilities. This does not mean buying more machinery to expand production. It means modernizing equipment; replacing the worn out and obsolete.

Employ more labor, by all means, but employ it at its maximum efficiency. To increase employment without a corresponding rise in production is to build on a shaky foundation. It means an inevitable crash.

If the Administration will help to bring the banks to do their part, industry will continue to do its part.

Fly-By-Night Consultants

REPORTS continue to reach up from our readers that they are being approached by consultants, experts, specialists, etc., with processes and services which promise the earth, and with guarantees of efficiency and freedom from patent infringement, all at small to negligible cost. We have heard again and again, sad stories of those who have accepted propositions and found to their sorrow that they did not live up to specifications.

The electroplating field is peculiarly susceptible to this evil. The industry has developed with such rapidity in the past ten years, and in so many different directions, that the average manufacturer or job plater, busy as he is with his immediate problems, has been unable to keep up with all the details. He is faced with new testing methods, with new methods of plating old metals, with methods of plating new metals and with the need for accurate control to meet customers' specifications. Fifteen years ago no one dreamed of plating palladium or rhodium commercially. These metals are now here. Chromium plating was a vision of the laboratory. It is now one of the largest branches of the industry. This has opened the field wide to the seller of "secret" formulae, "special" solutions and "quick" methods.

The trade needs new formulae, technical methods of control and new metals to plate. We have no quarrel with invention, nor have we any quarrel with the honest practitioner who has something definite to sell and is willing to exhibit his wares. But we must caution the trade against the type of expert who sells a method of control which is "good enough for practical purposes"; who sells a solution which is "secret" and cannot be analyzed; who "guarantees" a process against patent litigation, and has no funds to make good his guarantee; who pirates methods developed by others, makes installations haphazardly, has insufficient knowledge to make these installations work, and then disappears when trouble arrives.

To our readers who are considering going into any of the numerous developments of electroplating, we say never buy a cat in a bag. The seller must disclose the composition of his product. Be sure of the technical and professional standing of the people from whom you buy. Be sure that guarantees are backed by adequate finances.

Do not close your ears to new ideas, but be sure of their reliability before making investment.

Correspondence and Discussion

Screw Presses

To the Editor of METAL INDUSTRY:

We have read your answer in the April number of METAL INDUSTRY in regard to the relative merits of drop hammers and screw presses, and we gained the impression that you are not familiar with the latest developments in screw presses such as we manufacture. We have improved this type of presses so that they are now in most successful use in the industry and are replacing drop hammers and positive presses very rapidly for certain classes of work.

Compared with drop hammers our Patent Percussion Power Presses have the advantage that the speed of the blow is considerably lower than that of the hammers, so that the molecules of the material have time to fill the crevices of the die perfectly. A quick blow such as hammers yield must be of overstrength in order to obtain the same result, but this in turn, is ruinous to the dies.

The slide of these presses is exactly guided. The hammer of drops has to be loose in order to work perfectly. This leads again to danger to the dies and offset pieces.

Drop hammers are dangerous machines and many accidents occur. Patent Percussion Power Presses are very safe; do not require any physical exertion and can be operated by female help. Drop hammers are noisy and when placed in upper floors of buildings, springboards, posts, and other contrivances have to be used. Patent Percussion Power Presses can be placed on any floor. Many are operated in office buildings.

You seem to favor toggle presses as giving a higher output. This is only relatively true. It is not the number of strokes per minute that the machine makes, but the actual working strokes. As you will notice from the circular which we enclose, our presses make quite a number of strokes per minute and since the stroke is long the operator can remove the finished piece and insert a new blank while the press is going up. Thus, most any stroke of the press can be utilized. Expert operators sometimes do not wait for the press to go up and trip it again before it has reached the highest point, in this manner still increasing the output.

The main advantage of Patent Percussion Power Presses over toggle presses is, however, that they are immune to overload. Even if a careless operator should insert two pieces on top of one another no harm will be done, to either die or press. Positive presses will be stalled and frequent breakages occur. To cushion these presses, as you mention, is theoretically O. K., but practically it deadens the blow and not the proper results are obtained.

Toggle presses have to be adjusted very carefully to the thickness of the work to be done and even then the press may be overloaded without the operator knowing it, thus endangering the dies. Patent Percussion Power Presses do not require any accurate vertical adjustment, but by regulating the size of the blow of the press, a blow of given capacity is yielded

and this is beyond the control of the operator. The press once set for a certain blow and a certain job will give a blow of the proper capacity and no more.

The fact that these presses have a long stroke facilitates the insertion of the blanks and the removal of the finished work. The dies are clear of sight. The light has free access and accidents to operator are rather rare occurrences.

For certain classes of work automatic feeds can be attached to Patent Percussion Power Presses, thus eliminating the operator altogether and increasing the output to a considerable extent.

ZEH & HAHNEMANN COMPANY
Newark, N. J.

Platers' Organization

To the Editor of METAL INDUSTRY:

For a half a century the electroplater has held himself aloof from other craftsmen who have seen the need of labor organization. As a result, their industry has been pretty well dragged down, so that today, the electroplater is looked upon by his employer as just another cog in a machine, instead of as their most important asset, worthy of their good will and a station in their executive personnel. If the plater during all the past years did not see the importance of having a labor union in his poorly paid profession, he should look wisely today, and see it intelligently. Man has been thinking mechanically, and has developed gigantic machines of great capacity and production. But man has failed to see this coming breakdown which is nothing more than a case of developed horse power competing with man power. Because men did not organize themselves in protective bodies, so that they can be benefitted by the product of their brain, the machine, instead of being a livelihood jeopardized it.

Strikes are ruinous and very costly, particularly to the laboring man, whose state of health during such strife is lowered by worry, lack of food, etc. Arbitration is the most reasonable way of adjusting differences. All far-seeing big employers, ought to know that if society breaks down in its normal pursuit for bread, they are not immune to being dragged down with civilization's fall. A sinking steamer, when going down will drag into its whirlpool everything near it.

Employers should place no obstacles in the way of labor unionization. Electroplaters should seize the opportunity today of aligning themselves with organized labor. New York City already has a bona fide strictly platers union, whose aim is not strife, but reasoning arbitration, of any grievances found. Platers in other cities have the same. A new world is dawning, where the welfare of each man must be the concern of all, instead of "each man for himself, and the devil take the hindmost." Employers with eyes and with intelligence must read and heed, the handwriting on the wall if they wish to survive.

CHARLES BERLIN

Technical Papers

The Bullard-Dunn Process for Descaling Metals As Applied to the Cleaning of Heat Treated Gears. By Floyd T. Taylor, Bullard-Dunn Division, The Bullard Company, Bridgeport, Conn. A paper presented at a recent meeting of the American Gear Manufacturers' Association.

The Bullard-Dunn Process is a method of removing scale completely from metal surfaces without damage to the base metal. It is a simple, rapid and inexpensive electrochemical process uniquely different in principle from all other descaling methods and free from their inherent defects. What it accomplishes and how it works is described briefly in this paper.

In any method of descaling where work is oily or greasy, it is first necessary to remove the oil or grease. Metal washing machines, boiling soap or alkaline solutions, vapor de-

greasers, volatile solvents and electrified alkaline baths, commonly called "electric cleaners" can be used for this purpose. The alkaline electric cleaner, as recommended for use before Bullard-Dunn descaling, differs materially from the ordinary electric cleaner in that it has a "throwing power" and, therefore, efficiently removes grease and carbonized oil deposits from recessed parts.

Sulphuric acid forms the base of the descaling solution. Caustic soda and tri-sodium phosphate form the base of the baths used for degreasing or defilming. All of these chemicals are cheap, in abundant supply on the open market, and have the further advantage of being non-poisonous, familiar and customary in practically all manufacturing establishments.

Shop Problems

This Department Will Answer Questions Relating to Shop Practice.

ASSOCIATE EDITORS

Metallurgical, Foundry, Rolling Mill, Mechanical

H. M. ST. JOHN
W. J. REARDON

W. J. PETTIS
W. B. FRANCIS

Electroplating, Polishing, and Metal Finishing

O. J. SIZELOVE
G. B. HOGABOOM

A. K. GRAHAM, Ph.D.
WALTER FRAINE

Aluminum Zinc Anodes

Q.—We have been told that by adding 2% aluminum to cast zinc anodes the deposit is brighter, and the deposition is more rapid than when pure zinc anodes are used. Any information you could give us on the above would be very much appreciated.

A.—We have never heard of aluminum being added to zinc anodes for zinc plating. We are doubtful if it would have any effect upon the character of the deposit, because it would be impossible for the aluminum to be put into the solution and kept there by the electrolyte that is used in zinc plating.

Aluminum sulphate has been recommended for use in the acid zinc solution, but its effects are open to question, it being doubtful if any noticeable effects are produced in the character of the deposit.

O. J. S., Problem 5,227

Casting Pewter

Q.—I was very much interested in your answer to Problem 5189, "Casting Bronze in Plaster of Paris." Can you give me any information on casting pewter in plaster of paris molds? I am anxious to use up scrap pewter.

Must the molds be heated when casting pewter, as you recommend in casting bronze? Is it necessary to coat the face or interior of the molds with any preparation to prevent the castings from sticking to the plaster?

A.—To pour molten metal, either brass or white metal, in plaster molds, the mold should be thoroughly dried. It is necessary to oil the patterns before pouring the plaster, to keep the patterns from sticking. Lard oil gives good results for this work. Any light oil will do.

For pewter casting, however, bronze molds are desirable as they are cheaper, if you have any amount to make. However, for small amounts plaster molds will answer.

W. J. R., Problem 5,228

Finish for Door Knob

Q.—How can I produce the finish on the door knob I am sending you?

A.—The finish has been produced on sample submitted in the following way:

The steel door knob is tumbled with sand and water to produce a clean even finish; then brass plated to obtain a fairly heavy deposit of brass. Oxidize lightly in a dip made of white arsenic 2 oz., sodium cyanide 8 oz., water 1 gallon. The addition of a small amount of 26° ammonia will help to make the dip work faster. After the work is oxidized, it is sand blasted to even the color and to produce the desired finish. Finally, coat with a good grade of cellulose lacquer.

O. J. S., Problem 5,229

USE THIS BLANK FOR SOLUTION ANALYSIS INFORMATION

Fill in all items if possible.

Date.....

Name and address: Employed by:
Kind of solution: Volume used:
Tank length: width: Solution depth:
Anode surface, sq. ft.: Cathode surface, sq. ft.:
Distance between anode and cathode: Kind of anodes:
Class of work being plated: Original formula of solution:

REMARKS: Describe trouble completely. Give cleaning methods employed. Send small sample of work showing defect if possible.

Use separate sheet if necessary. _____

NOTE: Before taking sample of solution, bring it to proper operating level with water; stir thoroughly; take sample in 2 or 3 oz. clean bottle; label bottle with name of solution and name of sender. PACK IT PROPERLY and mail to METAL INDUSTRY, 116 John Street, New York City.

Finishing Silverware

Q.—We do a great deal of silver plating in our shop, both flatware and hollow ware. I am anxious to get information on the methods used, on old and new work, in metal coloring or finishing silver.

We realize that in order to satisfy our trade, we must keep up to date, and also eliminate the loss of time in this operation.

A.—In refinishing flatware and hollow ware, the old deposit of silver should be stripped by using a cyanide solution with reverse current. Such a strip should contain 12 to 15 ounces of sodium cyanide to each gallon of water. After the work is stripped, it should be scratchbrushed and repaired if necessary.

The work is then polished, cleaned by the usual cleaning methods and silver plated. If the work is made of nickel silver, it can be nickel plated for a few minutes, or it may be given a mercury dip before placing in the silver strike.

The silver strike should contain 6 to 8 ounces of sodium cyanide to each gallon of water and $\frac{1}{2}$ ounce of metallic silver.

If the work is made of soft metal, it should not be nickel plated, but after cleaning should be placed in a special silver strike made of sodium cyanide 10 ounces, silver chloride or silver cyanide $\frac{1}{4}$ oz., water 1 gallon. After using this special silver strike, use the regular silver strike, and the plate in the silver solution.

O. J. S., Problem 5,230

Imitation Gold Alloys

Q.—I note in reading the book "Metals and Their Alloys," by Vickers, that it mentions "Nuremburg Gold." The writer used this alloy twenty-five or more years ago, but is curious to know if any progress has been made since in keeping the color of this metal but eliminating the cost of 2.5% gold. Can you advise me of any recent reference in this matter?

A.—The alloy is a mixture of 90 copper, 7.50 aluminum and 2.50 gold.

The gold has been eliminated in the mixture, and it is now made up by several firms, among them a firm in Sheffield, England. According to reports, successful experiments have been made, they report the material is now stainless, and can be washed with alkaline solutions. Full dinner services can be made in the new alloy for the same price as nickel silver.

Also, this material has been on the market under the name of "Cupro." The analysis of "Cupro" shows it contains: 94.2 copper and 5.8 aluminum. "Cupro" was reported to be of a rich gold color, with a beautiful, permanent luster. Tarnish, dirt, coating with salt, etc., are removed from "Cupro" by washing with soap and water, leaving its brilliancy unimpaired.

It is also on the market under the name of "Dirigold," also used for dinner sets and tableware which will not tarnish. Analysis of "Dirigold" shows it contains: copper 89.70, iron 0.03, aluminum 9.94, nickel 0.20 and silver 0.10.

W. J. R., Problem 5,231

Leaded Bronze

Q.—You have undoubtedly published information regarding casting of heavy leaded bronzes. We would appreciate receiving information as to how this metal is handled, and what flux is used for same. Also, what protection is used on the cores to keep the metal from cutting into the cores.

A.—One of the methods used in making high lead alloy, such as 30% mixture calling for copper 64, lead 29 $\frac{1}{2}$, nickel 1, zinc 1, is to make an alloy of 10% nickel, 45% tin, 45% lead. Put in crucible together. Cover with powdered charcoal and melt. Heat to not above a red heat, as the tin cuts the nickel.

Pour in small ingots, and use as follows: copper 69, hardener 10, lead 25, zinc 1.

Melt the copper very hot before adding the hardener, because the nickel causes the metal to set quickly, and because the amount of lead is large: add the lead in small pieces, stirring constantly; and finally add the zinc.

Another method is to treat the lead with litharge (oxide of lead) by melting the lead in an open kettle and adding 2% litharge. Stir well and pour in ingots. Use this lead for your high lead mixtures, and add 1% of 30% manganese copper as a flux to the mixture.

To protect the core from eating in, use silica flour as a blacking, with molasses water as a binder.

For 50 copper, 50 lead treat the lead with galena ore in the same manner as described above in using litharge.

W. J. R., Problem 5,232

Pewter Deposit on Copper

Q.—Our engineering department would like some information regarding the methods used to obtain a pewter finish on copper ware.

A.—We presume from your inquiry that what you have in mind is to electroplate a pewter deposit upon copper ware.

Very little data is available on the electrodeposition of pewter. Being an alloy of tin and lead, it can undoubtedly be deposited from a caustic soda bath, as both metals are separately deposited from caustic soda baths. We suggest that you experiment with the following formula:

| | |
|-----------------------|----------|
| Sodium stannate | 12 oz. |
| Caustic soda | 4 oz. |
| Lead carbonate | 2 oz. |
| Water | 1 gallon |

Dissolve the lead carbonate separately in just enough caustic soda to take up the lead carbonate, and add to the solution small quantities at a time until desired color is had.

Solution is to be used at a temperature of 150°F., with 3 to 4 volts. Use part tin and part lead anodes.

O. J. S., Problem 5,233

Platinum Plating

Q.—Can you advise us of any process or substance that may be used in order to eliminate platinum plating in a dark color?

When the articles are removed from our platinum solution they show a very dark color, and we find it difficult to bring out the proper platinum finish on them.

A.—If you had given us the method used to prepare the platinum solution, we would be in a position to answer your question more satisfactorily.

Most platinum solutions decompose somewhat after being prepared for some time (that is, the platinum has a tendency to precipitate out of solution), and poor deposits are then produced.

If your platinum solution worked properly when first prepared, this is undoubtedly what has happened. If so, the only remedy would be to make a new solution and send the old one to a refiner.

O. J. S., Problem 5,234

Sodium Cyanide

Q.—Is there any particular advantage in using 95% sodium cyanide over 75% sodium cyanide for copper plating and cleaning of work before plating? Will the 95% dissolve more carbonate of copper than the 75%; if so, how much more?

A.—The 75% sodium cyanide, which is a mixture of cyanide and chlorides, is not used for plating operations. It is a case hardening mixture, and is used principally for that class of work.

O. J. S., Problem 5,235

Equipment

New and Useful Devices, Metals, Machinery and Supplies

Solid-Curb Chip Wringer With V-Belt Drive

Tolhurst Machine Works, Inc., Troy, N. Y., has introduced the Solid Curb Chip Wringer for extraction of oil from metal chips produced in high speed cutting operations. The equipment is stated to add to general efficiency and cost-saving by making possible to reclaim the oil for further use, and by adding to the value of the chips. The machine is entirely centrifugal in action, and is said to separate oil from a full load of chips in five to ten minutes.

The Tolhurst company states that average oil recovery of eleven manufacturers chosen at random was found

The basket is of heavy pressed steel, fitted at center with a casting to accommodate lifting hooks on hoist. An easily removable basket cover retains chips when machine is in operation.

The spindle of special steel turns in two heavy duty ball bearings, capable of withstanding severe radial and thrust loads. The bearings are sealed dust-proof. Lubricant is applied through a pressure fitting in top housing cap and readily accessible. Spindle pulley is attached to bottom of spindle. This leaves lubricant fitting and tension adjustment clear of all obstructions. This also allows endless belts to be passed between floor and bottom of spindle for application or removal.

A selective timer, supplied as optional equipment, cuts off power supply at the end of a predetermined run and signals the operator by light.

The wringer is available in the solid-curb type with baskets 20" and 26" inside diameter, and in center-slung type with baskets 40" and 48" inside diameter.



New Tolhurst Chip Wringer

to be 19 gal. of oil per 1,000 lb. of oil chips; best yield being 50 gal. per 1,000 lb. with 5,000 lb. chips handled per day; poorest, 6 gal. per 1,000 lb. (8,000 lb. handled per day). Four concerns reported a yield of 10 gals per 1,000 lb. (The variation was due to the character and shape of the chips themselves.)

Several new features are incorporated in the latest Tolhurst wringer. It has V-Belt drive. The external appearance of the machine has been changed by addition of belt guards, foot guards and basket hoist. Internal changes include heavy duty ball bearings supporting spindle; lubrication from a single source; spindle pulley allows application of endless belts without disassembly; single screw belt tightening device.

New X-Ray Apparatus for Inspection

The Industrial X-Ray Corporation, Los Angeles, Calif., has acquired the manufacturing and distribution rights to all the Metalix X-ray apparatus developed by N. V. Philips Corporation of Eindhoven, Holland. Available in three sizes, the new Metalix portable X-ray has been used in Europe for years, with over 3,000 standardized units operating. With it manufacturers can determine the quality of raw materials prior to their manufacture, and reveal defects heretofore hidden from surface inspection. The Metalix machines are designed to X-ray anything of a manufactured or fabricated nature. They will be on display at the World's Fair in Chicago until October.

The "Metalix 200" which is the largest size constructed at the present time, has been mounted on a two wheeled trailer, permitting its transportation to any location. Inside the work shop or on board ship, a suspension crane can convey the apparatus from place to place. This large type, like the smaller sizes, can be connected direct to 220V. A.C. outlet or to a 440V. power main. The apparatus itself consists of three components: high voltage generator, constructed in a metal container; control box built against this container incorporating the necessary switches and

regulating and measuring controls; two shock-proof high voltage cables which connect the transformer to the ray-proof and shock-proof Metalix tube.

The most complicated objects, such as cylinders, shafts, axles, pistons, etc., can be radiographed with this apparatus. Large cast objects, rolled material, welded material can all be examined through the medium of X-ray.

One of the most important factors in the Philips Metalix apparatus lies in the fact that only the primary useful beam of X-ray emits and that biologically harmful rays are absorbed at the source. Previous difficulty in eliminating the danger of harmful rays and the danger of high tension wires has prevented X-ray methods developed many years ago from being applied to industry before this time. The Metalix apparatus eliminates both unwanted radiation and the necessity of work with high tension wires.

Latest Products

Each month the new products or services announced by companies in the metal and finishing equipment, supply and allied lines will be given brief mention here. More extended notices may appear later on any or all of these. In the meantime, complete data can be obtained from the companies mentioned.

Welders' Eye Protection. New Oxweld No. 15 spectacles and Type AA flat-ground lens, mounted in canvas-bakelite frame, 50mm. diameter; said to give wider vision and increased protection from sparks and light; temples are insulation-covered, non-inflammable and non-heat-conductive; frame spreads for size, and lenses are inter-changeable with others for other work; several shades are available. Linde Air Products Company, 205 East 42nd Street, New York.

Thermometers; Pressure Gauges. A new, improved line of circular chart instruments. Thermometers indicate and record from 40°F. to 1200°F. Gauges, pressure and vacuum, for 10" of water up to 5,000 lbs. Helix mechanisms made after considerable research; other new features affect clock switch, door and lock, chart clips, chart hub, pens, torque, recalibration, zero adjuster, finish. See Catalog 6702. The Brown Instrument Company, Philadelphia, Pa.

Flexible Couplings, gear type, in standard sizes and power ratings; gears generated on Sykes machine, assuring extreme accuracy; large lubricant reservoir; made in double and single engagement types. Known as "Gearflex." Farrel-Birmingham Company, Inc., 344 Vulcan Street, Buffalo, N. Y.

New Haveg Pickling and Plating Tanks

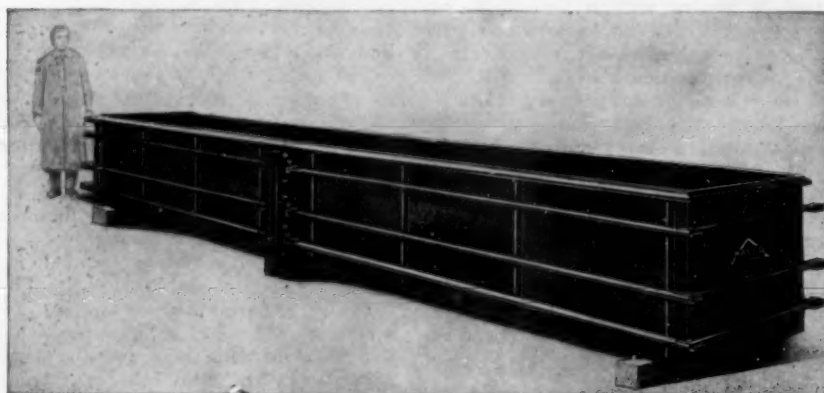
A line of pickling and plating tanks is made by the Haveg Corporation, Newark, Dela., which has some unusual properties. Haveg is a product, covered by patents, composed of asbestos used as a base material and molded into a solid homogeneous mass by mixing with a specially prepared acid-resisting rosin

maker states the material is so produced that it may be fabricated with a definite guarantee that coatings will not chip, peel or lift from the base metal. It is available in continuous coils, sheets or strips, with either highly polished or rich satin finish. Extreme uniformity is claimed, due to controlled manufacturing methods. Among applications mentioned are floor plates, office, store and restaurant equipment, stove pipe

like that of an automobile tire, will be shown in operation.

Convertible Universal Dual Head Airgun

Paasche Airbrush Company, 1909 Diversey Parkway, Chicago, Ill., announces the Model F679 convertible universal dual head airgun, and Type LF sprayer, a new development for dual application of powder, granules, flock, bronzes, etc., with suitable liquid adhesive. The maker states that decorative effects produced by this equipment have unusual luster and depth. They recommend it especially for manufacture of caskets, lampstands, household articles, book covers, etc. Standard specifications include the airgun and multiplehead and powder nozzles, gravity cup, pressure cup, and wrench. For mass production large-surface uses, specially designed pressure containers can be supplied, with hose to gun, making hand piece lighter and faster to operate.



Type of Haveg Tank for Pickling and Plating

of the phenol-formaldehyde type and subjecting the mold to heat and pressure.

Up to the present time one piece seamless Haveg tanks have been made as large as 10 ft. in diameter and 10 ft. in height. The material is light in weight, specific gravity 1.6, and it is claimed, stands blows or shocks exceptionally well and does not fracture or chip easily. It is stated that Haveg can be used up to 265 deg. F.

Cadmium Plating

M. S. Dennis, writing in "The Du Pont Magazine," makes some very interesting comments under the title, "Beauty and Utility in Cadmium Plating." The article explains the remarkable rust-resisting properties of cadmium coatings on steel and iron, and mentions a great number of products which are being protected by this type of deposit. It then gives a resume of the cadmium plating development work of the Grasselli Chemical Company, Cleveland, Ohio, a Du Pont subsidiary, which controls the "Cadalyte" cadmium plating process. In conclusion, the writer mentions an interesting 32-page book, "Cadalyte—A Process and Product for Cadmium Plating," which is available upon request to the advertising department of the Grasselli company.

Bonded Chrome Steel

American Nickeloid Company, Peru, Ill., is marketing Bonded Chrome Steel, a sheet material having cold rolled steel base with "electro bonded" coatings of copper, nickel and chromium. The

maker states the material is so produced that it may be fabricated with a definite guarantee that coatings will not chip, peel or lift from the base metal. It is available in continuous coils, sheets or strips, with either highly polished or rich satin finish. Extreme uniformity is claimed, due to controlled manufacturing methods. Among applications mentioned are floor plates, office, store and restaurant equipment, stove pipe

Houghton Exhibit at Metal Congress

E. F. Houghton and Company, Philadelphia, Pa., will exhibit in Booth 53 the latest developments by the Houghton research staff in the field of carburizers, quenching oil, heat treating salts, cutting oils, metal cleaners, rust preventives and drawing and stamping lubricants. Several new technical booklets will be available for the first time during the National Metal Congress, to be held October 2-6, 1933, at Detroit, Mich.

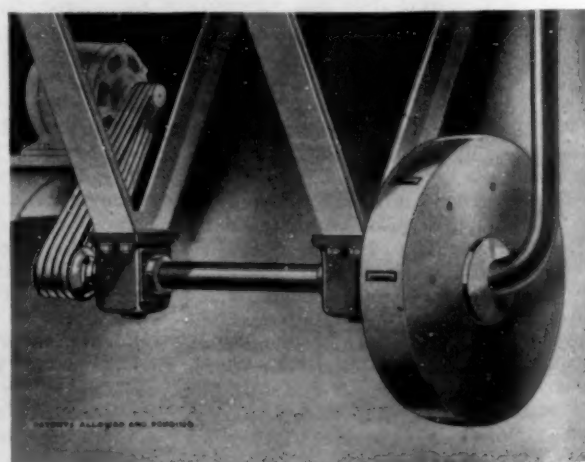
They will exhibit an entirely new line of industrial lubricants, known as "Sta-Put," and a new non-skid belt, known as "Vim-Tred," with non-skid tread

New Method of Abrasive Cleaning

A new method of abrasive cleaning has been developed by the American Foundry Equipment Company, Mishawaka, Ind., which is intended to replace sand-blasting. This method is embodied in a machine called the Airless Wheelabrator, a mechanical device using centrifugal force to throw the abrasive, and cleaning the work which passes underneath it. It is claimed that although the velocity of the abrasive is less than in sand-blasting with 90 pounds pressure, a much greater quantity is ejected and that the unique working construction of the Wheelabrator gives cleaning results which exceed high pressure blasting. Consequently, it is stated, acid pickling, abrasive scrubbing and other cleaning methods are unnecessary, as is also the costly compressed air used in sand-blasting.

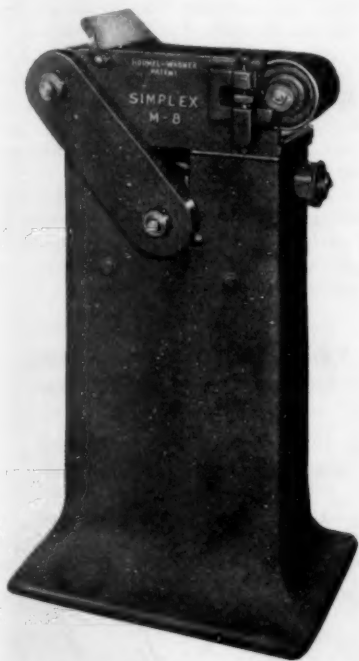
Another important saving is that only a fraction of the horsepower is required to operate the Wheelabrator that is needed for the compressed air equipment of similar capacity.

"Airless Wheelabrator" Equipment for Abrasive Cleaning



Abrasive Band Grinder

An abrasive band grinder is being marketed by the Walls Sales Corporation, 96 Warren Street, New York. This grinder, called the Simplex, is of the pedestal type, equipped with a $\frac{3}{4}$ horsepower, fully enclosed motor with roller chain drive. The machine is built for production work running 1900 ft. per minute, and is of extra heavy



New Simplex Grinder

construction, eliminating all vibration, according to the maker. It has a single thumb screw arrangement for belt alignment, removable bevel attachment, dust-proof ball bearings, and Alemite lubricating system. It is furnished complete with grease gun. It operates at 1450 R.P.M., weighs 425 pounds and occupies floor space 16" x 22".

Chromium Plating Machine

The Sturt Engineering Corporation, 341 W. Superior Street, Chicago, Ill., has developed a new model chromium plating machine designed primarily for handling screws, small bolts, rivets and small headed parts which will be offered in semi automatic and full automatic models, with an hourly capacity ranging from 3800 pieces for the semi automatic machine, for 8,000 for the full automatic machine.

The manufacturers point out that the work is carried with the head towards the anode, thus insuring full throw into the slot on screws. Loading and unloading are fully mechanical. The machine is designed to require the attention of only one operator. It will take a variety of pieces of work from a number 2 screw $\frac{1}{4}$ " long to a $\frac{3}{4}$ " bolt $2\frac{1}{2}$ " long. The head diameter of the part to be plated can be up to 1" in diameter.

Equipment and Supply Catalogs

Available free on application to the manufacturers mentioned, unless otherwise stated. Please mention this notice.

Blowers. Roots-Connersville-Wilbraham, Connersville, Ind. Bulletin 21-B16, illustrated.

Underneath Belt Motor Driven Lathes. Bulletin No. 101-A, South Bend Lathe Works, South Bend, Ind.

Belt Idlers. The Jeffrey Manufacturing Company, Columbus, Ohio. Bulletin 569 on new universal type idlers.

Heavy Duty Compressor. Ingersoll-Rand, 11 Broadway, New York. Illustrated booklet on Class "ES" equipment.

Patent Percussion Power Presses. Zeh and Hahnemann Company, Newark, N. J. Complete illustrated booklet, giving all engineering data, etc.

Trichlorethylene "Pechiney." International Selling Corporation, 70 Pine Street, New York. Interesting data on metal cleaning and degreasing. Illustrated.

Razor Blade Furnace. W. S. Rockwell Company, 50 Church Street, New York. Bulletin 341 on furnace for hardening, coloring and tempering by electricity or gas.

Valve Data Book. Jenkins Brothers, 80 White Street, New York. Catalog 23, giving complete data on over 400

valves, and valve layout; also useful engineering data.

Cadmium Plating. The Udylyte Process Company, 3939 Bellevue Avenue, Detroit, Mich. "Udylyte News" for August, 1933. Contains article on "A New Stripping Test for Udylyte Coatings."

Cleaning Metals. Philadelphia Quartz Company, 121 South 3rd Street, Philadelphia, Pa. "Right to the Point," a booklet on the use of sodium metasilicate as a metal cleaner. Contains formulae for use of this material for electro-cleaning metals.

A Key to Industrial Recovery, by Allen W. Rucker and N. W. Pickering, president, Farrel-Birmingham Company, Inc., Ansonia, Conn. This is the third of a series of booklets on topics of interest to business and industry. It discusses the economic justification for mechanization of industry, to show that installation of improved machinery is in keeping with the spirit of the recovery program, and benefits the employer and labor as well by permitting higher earnings for both. Free on request to the company mentioned.

News of Associations and Societies

Institute of Metals Division

The Institute of Metals Division of the AIME will meet at the Statler Hotel, Detroit, Mich., Oct. 4 and 5, during the Metal Congress, Oct. 2-6. The Wire Association; the American Welding Society and the American Society for Steel Treating, together with two Divisions of the Institute, constitute the Congress this year, and each body offers an interesting technical program. The National Metal Exposition will, as usual, be held concurrently. Institute members will register just outside the small banquet room of the Hotel Statler.

The meeting will open in the small

banquet room at 2 o'clock Wednesday afternoon with a joint session of the Iron and Steel and Institute of Metals Divisions. Two papers are scheduled: "Relation Between the Plastic Deformation in Deep Drawing and the Tensile Properties of Various Materials," by M. H. Sommer, and "Studies on Creep of Metals Using a Modified Rohn Test," by C. R. Austin and J. R. Gier. Dr. Austin's subject should be of special interest to a Detroit audience. In the same room at 6:30 o'clock the two Divisions will hold a joint dinner. This year the Dinner Lecture will be delivered by A. B. Kinzel, Chief Metallurgist of the Union Carbide and Carbon Research Laboratories, Inc.; his subject, "Silicon."

Round Table on Nonferrous Metals in the Automotive Industry

At 9:30 o'clock Thursday morning, the Institute of Metals Division will hold at the Hotel Statler a Round Table on Nonferrous Metals in the Automotive Industry. The tentative program includes the following topics and arrangements have been made looking to discussions, by especially qualified persons.

1. The economies resulting from the use of nonferrous metals in automotive parts.
2. The opportunity for nonferrous cutting tools.
3. The automotive uses of alloys possessing special expansion characteristics.

4. Bearings, including solid, bronze, and steel-backed, and bearings made from pressed metal powders.
5. Finishing nonferrous automotive parts.

In the afternoon at 2 o'clock, the Institute of Metals Division will hold a second technical session at which three papers will be presented: "Notes on the Cadmium-nickel System," by C. E. Swartz and Albert J. Phillips, A.I. M.E. Contribution—Preprint No. 55; "Copper Embrittlement, III," by L. L. Wyman, and "A Table for the Rapid Interconversion of Atomic and Weight Percentages," by Cyril S. Smith.

The Subcommittee and Advisory Council on the Terminology of Impurities in Metals will hold an open meeting at the Statler Hotel Thursday afternoon. Those interested are invited to attend and participate in the discussion.

The American Society for Steel Treating has arranged an interesting program of papers extending throughout the week. The 1933 Campbell Memorial Lecture will be delivered by H. J. French of the International Nickel Co. on Wednesday morning.

The 15th annual National Metal Exposition will be held at Convention Hall and, according to report, it will be the largest exposition since 1929.

Divisional Officers and Committeemen

The officers and chairmen of committees of the two Divisions meeting in Detroit are as follows:

Institute of Metals Division:

T. S. Fuller, Chairman; C. H. Mathewson, Past-chairman; W. A. Scheuch, Vice-chairman; J. L. Christie, Vice-chairman; E. M. Wise, Secretary; W. M. Corse, Treasurer; Committees: Finance, C. H. Mathewson, Chairman; Data Sheet, R. S. Archer, Chairman; Papers and Publications, J. L. Christie, Chairman, and A. J. Phillips, Vice-chairman; Annual Lecture, W. M. Corse, Chairman; Membership, J. R. Freeman, Jr.

New York Branch, A.E.S.

Summer meetings are usually dull and uninteresting but the past few meetings of the New York Branch of the American Electroplaters Society have proved to be quite the contrary. A great deal of discussion ensued about an industrial code for the plating industry.

Great credit is due to the efforts during the past year of Messrs. Stremel, Levine, Fisher, Rolfe, MacStoker, Kelly and Sterling who have been untiring in their efforts to improve the general knowledge of plating among the members of their Branch by giving freely the results of their own experiences and of the knowledge which they have gained.

At the August 10th meeting the members stood in silence for one minute in memory of the late Charles H. Buchanan who ten years ago was made an honorary member of the Branch.

Officers for the coming year were elected. **President**, John Rolfe; **Vice-president**, George Wilson; **Secretary-treasurer**, John E. Sterling; **Recording Secretary**, Arthur Wallace; **Librarian**, Ralph Liguori; **Sergeant-at-arms**, Samuel Goldstein; **Assistant sergeant-at-arms**, Harry Carlin; **Trustees**, Messrs. Fisher, MacStoker and Stremel.

Newark Branch, A.E.S.

On Saturday, September 16, 1933, the Newark Branch of the American Electroplaters' Society will hold its Second Annual Clam Bake at Vogel's Grove, Springfield, N. J.

The committee in charge has arranged to make this "bake" equal to the one held last year, which was considered, by those who attended to be the best that could be had. For success we must have the support of all the members, as we have obtained a reduction in the cost of the dinner with provision that we have an attendance of at least 100.

The "bake" is for the ladies as well as the men, and there will be games for both to make the occasion enjoyable.

The committee must know at once exactly how many are going to attend, as we have to pay the caterer \$2.25 for each dinner that is served, and he will serve only as many as we have tickets that are paid for by September 9.

Tickets for adults are \$3 and for children under 12 years \$1. Tickets can be obtained from the committee, consisting of H. H. Smith, 208 North 3rd Street, Newark, N. J., O. J. Sizelove, and George Wagner.

Make your reservations early. Spend a day in the country and forget about your troubles.

THE COMMITTEE.

Institute of Metals

The Institute of Metals, Great Britain, will hold its 25th Autumn Meeting at Birmingham, England, September 18-21. A large and varied program of events has been arranged. The Twelfth Autumn Lecture will be delivered by W. R. Barclay on Twenty-five Years' Progress in Metallurgical Plant. There will be a number of general meetings, luncheons, excursions, a ladies' program, and a reception and dance are scheduled.

National Association of Chemical Specialty Mfrs.

The National Association of Chemical Specialty Manufacturers has been formed as a non-profit membership association to provide for firms in that general industry under the National Industrial Recovery Act, the Administration having confirmed the opinion that there was no association organized to represent the field as a whole.

The plan has the approval of and sponsorship of many firms of importance in the field. A general code for the

industry has been drafted by a committee and copies are available for firms interested.

It was hoped to have the general code approved and in effect about September 1st, with sub-codes for many divisions of the field such as alkaline cleansers, cleaning solvents, plumbing specialties, metal polish, greases and special lubricants, and many other products. The sub-codes include provisions to take into account conditions peculiar to the manufacture and distribution of each group. A member of the association may belong to as many of these groups as apply to the products he manufactures. Such additional sub-groups will be formed as are indicated to be desirable.

An outline of the purposes and a copy of the general code can be obtained by addressing the National Association of Chemical Specialty Manufacturers, 305 Washington Street, Brooklyn, N. Y.

Chemical Engineering Equipment Institute

The Chemical Engineering Equipment Institute has been organized with headquarters at 50 E. 41st Street, New York, by the manufacturers of equipment used in the chemical industries. At the first meeting 35 firms were present, and a temporary organization was set up with the following officers:

President, H. D. Miles, President, Buffalo Foundry and Machine Company, Buffalo, N. Y.; Vice-president, P. C. Kingsbury, Vice-president General Ceramics Company, New York; Secretary-Treasurer, D. H. Killeffer, consulting chemical engineer.

This Institute will be affiliated with the Machinery and Allied Products Institute of Chicago. It is intended that firms covered by duplicate or overlapping codes will be affected by the Chemical Engineering Equipment Institute only as their production fits into the Institute's definition of its scope.

Waste Material Dealers

At its 1933 convention held last month at Chicago, Ill., the National Association of Waste Material Dealers adopted a code and decided to form a secondary metals institute.

At the meeting of the scrap metal division presided over by Chairman Ben Friedman, it was decided to form a secondary metals institute with headquarters in Chicago. The institution will remain a part of the National Association.

George Birkenstein of S. Birkenstein & Sons, Inc., Chicago, was re-elected president of the Association.

The National Association of Waste Material Dealers, through its managing director, reports that the re-organization of its metal division under the name of the Secondary Metal Institute has met with instant favor on the part of many in the secondary metal industry not previously connected with the Association.

National Scrap Metal Dealers' Association

National Scrap Metal Dealers' Association, a new organization, was formed last month at Chicago, Ill., with Harry Braman of Charles Braman and Son, Chicago, as president. Chapters have been formed in Chicago, New York, Philadelphia, New England and other scrap trade centers, and a code is being prepared. Other officers are: M. Goldfine, Western Metal Company, Chicago, vice-president; Morris Cohen, L. S. Cohen and Company, Chicago, secre-

tary-treasurer. An executive board consisting chiefly of members of the Chicago scrap metal trade has been elected.

United Electroplaters League

On Tuesday, August 22nd the United Electroplaters League met at Teutonia Assembly Rooms, 158 3rd Ave., New York. The purpose of the meeting was to acquaint the platers with the advantages of organization for platers as craftsmen. About 100 attended.

The meeting was addressed by several well-known members of the plating craft, including F. J. MacStoker, Royal Clark and John E. Sterling. Another speaker was Martin B. Apy, past president of the Stereotypers and Electroplaters Union.

It is noteworthy that the speakers stressed the need for a square deal for employers as well as employees; that the men must give their share if they expect to receive benefits.

Plans are afoot to hold more meetings and to establish branches in other cities to form a national organization.

Personals

James L. Wick, Jr.

James L. Wick, Jr., president and general manager of the Falcon Bronze Company, Youngstown, Ohio, has been elected a director of the American Foundrymen's Association for a three-year term, 1933-35. Mr. Wick has been active in the Association's work for a number of years, especially in the field of nonferrous research.



JAMES L. WICK, JR.

Born in Youngstown in 1883, Mr. Wick received his technical training at Massachusetts Institute of Technology, graduating in 1906 with a B. S. in mechanical engineering. During his summer vacations he worked in the plant of William Tod Company, Youngstown, now a unit of United Engineering and Foundry Company.

On leaving school he became associated with Youngstown Sheet and Tube Company, and also with Natural Light and Thorium Company, as assistant superintendent. In 1908 he became general manager and treasurer of the Crystal Ice and Storage Company, designing and rebuilding their plant. Returning to Youngstown Sheet and Tube Company in 1918, he was with

them for a short while as special agent for claims. In 1919 he became associated with his present firm, the Falcon Bronze Company, as secretary and assistant general manager. He became president and general manager in 1925.

Mr. Wick holds memberships in the American Foundrymen's Association, American Iron and Steel Institute, American Institute of Mining and Metallurgical Engineers, American Society for Testing Materials, and National Founders Association.

Leo I. Smith, 45 Borham Road, Belmont, Mass., has been appointed New England representative for Roots-

Connersville-Wilbraham, Connersville, Ind., manufacturers of blowers, gas exhausters and meters, liquid vacuum pumps, centrifugal equipment, inert gas machines, etc. Mr. Smith has been with B. F. Sturtevant and Company, Semet-Solvay Company and other firms, in sales and engineering capacities, and is widely acquainted in his territory.

J. C. Fox, chief chemist and metallurgist of the Doehrer Die Casting Company, New York, has moved his headquarters from the company's New York office to its plant at Toledo, Ohio, where the executive offices are now located. Mr. Fox continues his duties as heretofore.

Obituaries

Fred J. Liscomb

Fred J. Liscomb, one of the most widely known men in the electroplating supply and equipment industry, died at Chicago, Ill., July 29, 1933. He was 63 years old.

"Dad" Liscomb, as he was affectionately known through the plating and polishing industry, began his career in the plating trade as a young man. After some years as a plater, he entered the field of equipment and supplies for that industry, acting as a trouble man for the old Hanson and Van Winkle Company at Newark, N. J., which has since then become part of the present Hanson-Van Winkle-Munning Company, Matawan, N. J. Mr. Liscomb rapidly became well known and extremely popular, his work taking him into numerous plating plants and departments throughout the country. During his lifetime there was hardly a plater who did not have some contact with him. A special interest of his was the American Electroplaters' Society, at whose conventions he was always a prominent figure.

At one time, "Dad" Liscomb left Hanson and Van Winkle and went with the Udylyte Process Company, Detroit, Mich., also as plating expert and trouble man. He went back to Hanson and



FRED J. LISCOMB

Van Winkle, however, and when that company merged with Munning, he remained with the combine. In his latter years there he stayed in the Chicago and mid-West territory.

In 1931, Mr. Liscomb left Hanson-Van Winkle-Munning and went into business for himself, establishing the Fred J. Liscomb Electro Chemical Laboratory, Chicago. He was building up this business at the time of his death, which occurred suddenly at the Swedish Covenant Hospital. True to his lifelong interest, "Dad" Liscomb was at the platers' convention at Chicago this year.

Mr. Liscomb, who lived at 6066 Nickerson Avenue, Chicago, is survived by his widow and two daughters.

Charles H. Buchanan

Charles H. Buchanan, widely known in the electroplating industry, of which he was a member for the many years of his business career, died July 24, 1933, at Hinsdale, Mass., after a lingering illness. He was 74 years of age.

CHARLES H.
BUCHANAN



Mr. Buchanan was the son of James Buchanan, a pioneer in the electroplating business in New York City, where for many years he maintained a plating business on Ann Street. After his father's death, Charles Buchanan, then 22 years old, took over the Ann Street business, and carried it on for more than 20 years. At the end of that time, due to failing health, Mr. Buchanan retired from business and went to Hinsdale, in the Berkshires, where he regained his health sufficiently within a year to accept a position as traveling salesman for C. Upham Ely of 60 Vesey Street, New York, who operated a foundry at New Haven, Conn. Mr. Buchanan remained with the Ely concern for some years, covering a wide territory, and making many friends in the foundry and metal fabrication trades. When Mr. Ely was obliged to retire due to failing health, Mr. Buchanan took a position as agent for Apothecaries Hall Company, Waterbury, Conn., manufacturers of anodes and platers' chemicals and supplies. He remained with this company up to the time of his death.

Charles Buchanan was a charter member of the American Electroplaters' Society, New York Branch, and upon retirement was made an honorary member. He is survived by his widow, Mrs. Carrie Buchanan, and a brother, William Buchanan, of Los Angeles, Calif. Burial was at Hinsdale, Mass.

Elijah W. Hodge

Elijah W. ("Billy") Hodge, veteran foundryman and founder in 1883 of the Hodge Manufacturing Company, Greenville, Pa., died at that city June 4, 1933, a few days before he was 90 years old.

Mr. Hodge was born in England, and began his career in the woolen mills. He came here in 1868 when he was 25, and at first worked in a woolen mill at Greenville. He turned to foundry work within the same year he arrived, going to Hamblin and Son Company, where he became a molder. In 1876 he set up a small brass foundry, from which he developed the present Hodge company, founders and manufacturers of the Hodge furnace.

Throughout his life Mr. Hodge was noted for his democratic attitude toward his employees and the people of his city, and his benefactions were large. "Hodge's picnic" became a local holiday at Greenville, occurring annually for more than 40 years.

Robert H. Taylor

Robert H. Taylor, president of the Yerges Manufacturing Company, Fremont, Ohio, producers of cotton buffs, died June 26, 1933. He was 59 years old.

Mr. Taylor was born at Lockport, N. Y. He was associated with the polishing and plating industry for 38 years, for the last eight of which he had been president of the Yerges company. He had a very wide acquaintance in the metal and finishing industries, especially



ROBERT H. TAYLOR

the automotive lines, and was very well and favorably known in the buff business. His knowledge of finishing and polishing was considered authoritative. He was a member of the American Electroplaters' Society.

Mr. Taylor is survived by his widow, a son, and his parents.

Donald Baine

Donald Baine of 1425 North Massasoit Avenue, Chicago, Ill., representative in that territory of Hanson-Van Winkle-Munning Company, Matawan, N. J., died there last month. Mr. Baine was very well known in the plating supply industry.

Frank Greenwald

Frank Greenwald of the Grunow Corporation, Chicago, Ill., died there last month. Mr. Greenwald was well known in the plating industry. His death was very sudden. He had attended the convention of the American Electroplaters' Society at Chicago in June, and had presented a paper on Cadmium Plating. Mr. Greenwald's home was at 906 Mapleton Avenue, Oak Park, Ill.

During his thirty years in the plating industry, Mr. Greenwald had been associated with Mulholland Brothers, Aurora, Ill., L. A. Becker Company, Grand Haven, Mich., and Cleveland, Ohio, the Artcraft Company at Sycamore, Ill. He had been in charge of the plating department of the Grigsby-Grunow Corporation in Chicago for the



FRANK GREENWALD

past five years until last spring when he joined the Grunow Corporation now the General Household Utilities Corporation, Chicago, Ill.

Mr. Greenwald had been president of the Cleveland Branch and the Chicago Branch of the A.E.S. during his activities in the Society.

He was very active in the affairs of the A.E.S. and his loss is felt keenly. Mr. Greenwald leaves a widow, Mrs. Edna Greenwald, and three sons.

Leo Frankel

Leo Frankel, president of Frankel Brothers Metal Company and the National Electric Heating Company, Toronto, Ont., died August 9, 1933, aged 69 years.

Born in Germany, Mr. Frankel came to Canada at the age of 17. He began his career with the Dominion Iron and Metal Company, and later became secretary of that concern and the Railway Supply Manufacturing Company. He founded Frankel Brothers in 1886, with his brother, Maurice. He was active head of the company, and became its president when it was incorporated in

1923. Mr. Frankel was always active in social work.

William H. Grubb

William H. Grubb, controller of the International Nickel Company of Canada, Ltd., died August 14, 1933, at his home in Passaic, N. J. He was 58 years of age, a native of Ireland. He had been with the Nickel company and its predecessors for 30 years, starting as a clerk. He was made controller in 1928.

J. Howard Muzzy

J. Howard Muzzy, chairman of the board of the Federal-Mogul Corporation and prominent in the foundry and automotive industry, died of heart attack on Wednesday, August 9, at Nearbrook, his country estate in Bloomfield Hills, a Detroit suburb.

Born in Romeo, Mich., 68 years ago, Mr. Muzzy came to Detroit in 1885, and soon after entered the mill-supply business. In 1898 he and Edward Lyon formed the Muzzy-Lyon Company, Ltd. Mr. Lyon, however, sold his interest

to Mr. Muzzy in 1908. When the automobile industry began to develop in the early 1900's, Mr. Muzzy started producing engine bearings and bushings. In 1922 the business had so expanded that it was necessary to build the present plant at Shoemaker and Lillibridge Avenues. In 1924, Mr. Muzzy's company, which had been operating under the trade name of "Mogul" merged with the Federal Bearing and Bushing Corporation, and the corporate name was changed to Federal-Mogul Corporation.

F. J. H.

Industrial and Financial News

Lacquer Merger

The announcement of The Zapon Company, a subsidiary of Atlas Powder Company, that its Western business has been combined as of September first with that of the Brevolite Lacquer Company, of North Chicago, Illinois, should be of interest not only to all users of finishing materials, but to the business world in general. The consolidation will be known as The Zapon-Brevolite Lacquer Company. A new corporation of that name has been formed under the laws of the State of Illinois.

The consolidation, which brings together the Western division of one of the oldest lacquer companies in the country with one of the largest of the younger ones, should mean much to both, because it will furnish The Zapon Company with a completely equipped plant in the Middle West, and give Brevolite a stronger organization and greatly enlarged research facilities.

The Zapon Company was founded in 1884 and in addition to being the oldest manufacturer of pyroxylin base finishing materials, is also one of the world's largest producers of leather cloth, suede fabric, auto top and similar materials.

The Brevolite Lacquer Company was founded in 1919 by the late Dr. Brevis, one of the pioneer lacquer chemists of the country. It has enjoyed a steady growth and occupies at the present time a modern fireproof factory, constructed in 1930, at North Chicago, Illinois.

Leonard Richards, Vice President of Atlas Powder Company has been elected President and General Manager of all activities of The Zapon Company including the Zapon-Brevolite Lacquer Company. J. W. Hanson, Jr. will be Assistant General Manager in charge of operations, research and development, and M. J. Creighton will be Assistant General Manager in charge of sales. J. M. Howard will continue as General Sales Manager of lacquers and synthetics in the territory served by the Stamford factory, while Casper Apeland formerly President of the Brevolite Lac-

quer Company, will be General Manager in charge of all activities of the newly formed company.

Although for the present the Chicago branch of The Zapon Company will continue at its location at 45th & La Salle Streets, it is hoped that the activities of the new company can be centralized as soon as possible in the Brevolite factory and sales office in North Chicago, Illinois. Except for this, no change is anticipated in either the Brevolite or

Zapon organizations. Personnel, products and policies will remain unchanged assuring the continuation of all trade relationships.

The Eastern business, as well as the entire leather cloth and kindred fabrics department will be conducted, as heretofore, by and under the name of The Zapon Company, from the plant at Stamford, Connecticut, and from the branch offices in New York and Detroit.

Secondary Metal Output and Value in 1932

The following table, issued by the United States Bureau of Mines, Washington, D. C., shows a large decline in production and value of nonferrous metals recovered from scrap and other secondary sources in 1932, as compared with 1931. Decreases in value were due both to lower prices and curtailed production.

"Secondary metals" are those recovered from scrap metal, sweepings, skimmings, and drosses, and are so called to distinguish them from metals derived directly from ores, which are termed "primary metals," according to the Bureau of Mines. The distinction does not imply that secondary metals

are of inferior quality, for metals derived either from ore or from waste materials vary in purity and in adaptability to use in making certain products.

The figures furnished by producers cover seven metals—secondary copper, lead, zinc, tin, aluminum, antimony, and nickel—and supplement those on the primary metals. They are given to enable producers and consumers to form a more comprehensive idea of the quantities of metal available for consumption; in fact, they constitute an essential addition to the figures in the general reports on the primary metals which are compiled by the Bureau of Mines.

Secondary Metals Recovered in the United States, 1931-32.

(As reported by the United States Bureau of Mines)

| | 1931 | | 1932 | |
|---|------------|---------------|------------|--------------|
| | Short Tons | Value | Short Tons | Value |
| Copper, including that in alloys other than brass | 261,000 | \$47,502,000 | 187,700 | \$23,650,200 |
| Brass scrap remelted | 122,800 | 17,932,000 | 86,400 | 8,916,500 |
| Lead as metal | 128,800 | 17,367,800 | 128,000 | 11,898,000 |
| Lead in alloys | 105,900 | | 70,300 | |
| Zinc as metal | 34,800 | 3,207,200 | 20,000 | 1,578,000 |
| Zinc in alloys other than brass | 7,400 | | 6,300 | |
| Tin as metal | 5,500 | 9,428,800 | 4,650 | 6,248,100 |
| Tin in alloys and chemical compounds | 14,300 | | 10,100 | |
| Aluminum as metal | 15,200 | 12,726,000 | 12,200 | 10,992,000 |
| Aluminum in alloys | 15,100 | | 11,800 | |
| Antimony as metal and in alloys | 7,900 | 1,061,800 | 6,450 | 725,000 |
| Nickel as metal | 270 | 1,449,000 | 200 | 1,015,000 |
| Nickel in nonferrous alloys and salts | 1,800 | | 1,250 | |
| Totals | 720,770 | \$110,674,600 | 545,350 | \$65,022,800 |

Complaint Under NRA Filed Against Aluminum Co.

A complaint to President Roosevelt involving "abuse" inimical to the public interest and contrary to the policy of the national industrial recovery act was filed with the NRA on August 9 by three independent manufacturers of aluminum products, according to the Washington correspondent of the "N. Y. Herald Tribune". They charged the Aluminum Company of America with unfair competitive practices "in selling products in competition with the complainants and others for less than the sum of the market value of the aluminum used in the fabrication process and the cost of such process."

The signers of the complaint were Baush Machine Tool Co., Springfield, Mass.; Aluminum Products Corporation, LaGrange, Ill., and the Sheet Aluminum Corporation, Jackson, Mich. Their complaint recites:

"Unless the Aluminum Company of America is compelled to desist from the abuses herein complained of, the complainants will find it difficult, if not impossible, to continue to perform their obligations under their agreement with the President to raise wages and to create employment."

They stated that they had signed the blanket code, but that the Aluminum Company had not.

Carbonated Beverage Bottlers

The manufacture of bottled carbonated beverages is an industry that is almost completely mechanized. The ingredients are mixed by machinery and automatically conveyed to the bottles, which likewise are washed, sterilized, filled, labeled, capped, and often packaged, by machinery. The 7,000 plants in the industry, therefore, are large users of a great variety of metal products, the makers of which will be substantially represented at the Annual Convention and Exposition of the American Bottlers of Carbonated Beverages in Louisville, Ky., Oct. 9 to 13. Among the exhibitors are Atlas Copper & Brass Manufacturing Company, Chicago, Ill., Ingram-Richardson Manufacturing Company, Beaver Falls, Pa., International Filter Company, Chicago, Ill., Liquid Carbonic Corporation, Chicago, Ill., Moss & Sons, Inc., J., Brooklyn, N. Y., Pfaudler Company, Rochester, N. Y., Reeves Pulley Company, Columbus.

Reservations of exhibit space are made through the A.B.C.B. Convention and Exposition Department, 237-239 Woodward Avenue, Detroit, Mich.

\$3,993,319 Estate Left by S. H. Jones, Bronze Man

The estate of Stewart H. Jones, pioneer bronze man, who founded the Canadian Bronze Company, was appraised last month at \$3,993,319 net. He made large bequests to hospitals in New York and Detroit, and to relatives.

Course in Chemistry for Electroplaters

The City College of New York is again giving an evening course in electroplating this fall. It is especially designed to teach the fundamentals of chemistry and electrochemistry to platers. The lectures and laboratory work are such that any practical plater or even beginner may easily understand and readily apply the knowledge to his practical experiences. This course will also bring information up to date concerning commercial plating processes of copper, nickel, chromium, cadmium, zinc, brass, iron, lead, tin, silver, gold, platinum, and rhodium.

In the laboratory the student makes and tests plating baths and deposits, and analyzes the plating solutions with reagents which he makes himself.

The course is given under the personal direction of Dr. L. C. Pan. The class meets Mondays and Wednesdays, beginning October 2, from 7 to 11 p.m., in the Chemistry Building, Amsterdam Avenue and 139th Street, New York City. Registration may be made September 26 to 29, either in person or by mail.

Corporation Reports

Reports of corporations for first six months of 1933, with comparisons for same 1932 period, follow:

American Metal Co., Ltd., New York: Net loss, \$65,969; 1932, net loss \$621,453.

Anaconda Wire and Cable Co., New York: Net loss, \$449,589; 1932, net loss, \$559,842.

Eagle Picher Lead Co., Chicago: Net income \$499,286; 1932, deficit, \$633,027.

Hoskins Mfg. Co., Detroit, Mich.: Net income, \$25,256; 1932, \$45,178.

International Silver Co., Meriden, Conn.: Net loss, \$412,650; 1932, net loss, \$863,663.

National Lead Co., New York: Net profit, \$1,698,352; comparison unavailable.

New Jersey Zinc Co., New York: Net profit, \$1,370,380; 1932, \$1,078,999.

Revere Copper and Brass, Inc., New York: Net loss, \$224,390; 1932, net loss, \$815,214.

Reynolds Metals Co., Louisville, Ky.: Net profit, \$573,617; 1932, \$504,745.

Aluminum Industries, Inc., Cincinnati, O.: Net profit, \$62,291; 1932, net loss, \$19,062.

Business Items---Verified

Lakeland Manufacturing Company, Dover, N. J., recently organized, has leased building on King Street for plant to make hoists, electrical household appliances, etc.

Johnson Bronze Company, New Castle, Pa., has announced a wage increase for its 550 employees which will average \$10,000 monthly, according to P. J. Flaherty, president.

Hookless Fastener Company, Meadville, Pa., will construct a 3-story and basement building, 60x300 ft., to cost about \$200,000. Company has stamping and plating departments.

Peak Motor Products, Inc., has leased a 2-story building at 554 West 48th Street, New York City, for new plant to manufacture automobile parts. Departments include: tool room, stamping, soldering, brazing, polishing and lacquering.

Building Products Corporation, 1425 Welton St., Denver, Colo., **George A. Wright**, president, has been appointed Colorado sales representative for **The Mills Company**, Cleveland, Ohio, and will handle the sale of the Mills line of metal partitions.

Aluminum Specialty Company, Manitowoc, Wis., has acquired business and equipment of **Metal Goods Corporation**, St. Louis, Mo., and will consolidate operations at Manitowoc. Purchaser is maker of small aluminum ware and also has plant at Chilton, Wis.

Coppus Engineering Corporation, Worcester, Mass., has appointed **John O. Weber**, 122 Main Street, Louisville, Ky., representative for part of Kentucky.

Mr. Weber is widely known and will have charge of sales in his district of the entire Coppus line of forced draft and ventilating blowers, man cooling fans, steam turbines and turbo-generators.

Lumber Bi-Products, Inc., 702 M. & T. Building, Buffalo, N. Y., has expanded activities by establishing a Wood Flour Division at Manchester, N. H., having purchased the former New England Mills there, a plant covering 6½ acres, complete with rail sidings. Production is now 1,500 tons of wood flour monthly. The material has many uses; in the metal lines it is used in tumbling, burnishing, sawdust rumbling, etc. Foundries use it in core work.

The Ault and Wiborg Varnish Works, Inc., Cincinnati, Ohio, announces the change of its corporate name to Ault and Wiborg Corporation, in recognition of the complete service offered by the company in the manufacture of industrial finishes, embracing all lines, which has been strengthened recently by additions to the technical and sales personnel. The management and policies continue as before, the change being one of name only. The company has always been progressive in the field of industrial finishes, and has been particularly successful with its products for tin printing, metal decorating and metal furniture. It was one of the first in the field with modern industrial pyroxylin lacquers. Among its specialties are refrigerator finishes, and other finishes of lacquer and other types, designed to meet exacting conditions.

New Incorporations

Titus Foundry Company, Coldwater, Mich.; iron and aluminum foundry, polishing and grinding rooms; by **Thurlow W. Titus**.

Westelectric Castings, Inc., 1610 Camfield Avenue, East Los Angeles, Calif.; ferrous and nonferrous foundry; **S. Gee Lowe**, president; **J. W. Feltes**, v.-p.; **W. T. Howell**, secretary.

Alloy Foundry and Signal Company,

Saginaw, Mich.; manufacture signal and electrical devices; has nonferrous foundry, machine shop, stamping, tinning, soldering, polishing and grinding departments.

Diamond Pattern and Manufacturing Company, 702 St. Antoine Street, Detroit, Mich.; \$5,000 capital stock, with \$1050 paid in; to make wood and metal patterns and light machinery; plant on two floors has 6,000 sq. ft.; firm mem-

bers are **H. A. Place**, president; **J. N. Giles** and **M. J. Fett**, well known in Detroit pattern trade.

Arsenal Bronze Company, 32nd and Smallman Streets, Pittsburgh, Pa., to manufacture all types nonferrous castings of special and standard analyses, and a line of memorial tablets; has taken over former plant of **Hill-Wallis Bronze Company**; **H. G. Shook**, president; **W. G. Flood**, v.-p.

News From Metal Industry Correspondents

New England States

Waterbury, Connecticut

September 1, 1933.

The **American Brass Company**, **Scovill Manufacturing Company**, and **Chase Companies, Inc.** have signed the President's emergency code and received the right to display the Blue Eagle, pending the adoption of the brass code, but by special permission have the right to operate under the brass code as to hours and wages. However, all are paying a minimum of 40 cents an hour, although the code sets the minimum at only 35 cents for men and 30 cents for women. They are also limiting hours to 40 a week.

There is still some uncertainty as to what codes the local plants will operate under, as a metal fabricating code is being worked out. The local plants do work that would come under both codes, and there may be some discrepancy between them.

There has been a great increase in employment during the past month, partly due to the adoption of the code, but more to a general increase in business, according to local brass leaders. The increase started before the code was adopted, and the payroll increases started before then, as all the concerns adopted the 40 cents an hour minimum during the latter part of July.

It is estimated that over 1,500 men have been put back to work since Aug. 1, and that weekly payrolls have been increased over \$50,000, both through the NRA program and through the wage increases and additional employment resulting from increased business that would have come anyway. In fact, even greater increases in numbers of employees and in payrolls were made during July.

The tentative copper and brass products code calls for a minimum of \$14 a week for men and \$12 for women, with the 40 hour week. However, at last reports, the code was being held up pending an agreement between the primary and secondary producers as to codes and the development of a code for the metal fabricators. The main problem for the primary producers is said to be production control. What

they decide on will have so much bearing on the secondary producers that the NRA wants to hold up action on the copper and brass products code.

Representatives of the fabricators met in Hartford Aug. 22 to approve a so-called "umbrella" code covering upward to 200 plants and 60,000 employees in the state. It is expected that this basic code will eventually cover 7,000 plants in the country, employing over 1,000,000 persons. **William M. Goss**, secretary of **Scovill's** was chairman of the committee arranging the meeting. As a result the **Fabricated Metal Products Federation** was organized, with **H. D. North** of the **U. S. Cap and Screw Company** of Hartford as president and **William Goss** as secretary.

A 10% increase in wages, in addition to the 5% increase given in July was announced by the **Waterbury Clock Company** last month. This increase was decided upon, but not announced, the afternoon before the evening on which several hundred employees of the concern gathered at a meeting to demand an increase and at which threats of a strike were made. **President James R. Sheldon**, announcing the increase, said that the company had but 200 employees on its payrolls in April, and that now it has in excess of 2,200, resulting in a payroll increase of 250%. Much of the increase is due to the popularity of the "Mickey Mouse" **Ingersoll** watch. The **Clock Manufacturers' Association**, to which the company belongs, is working out a code which is expected to be approved shortly.

John H. Goss, vice-president of **Scovill's** who has been appointed chairman of the state NRA committee, is organizing the campaign throughout the state. He officially opened it at a state wide meeting in Hartford Aug. 1.

Mr. Goss, at a local meeting, recommended a plan to secure the cooperation of the banks in thawing out frozen accounts of merchants, owed by factory employees who have been out of work or on short time. This involves the banks taking over these accounts, lending the merchants a substantial part of their value, and effecting an arrange-

ment with the factories to deduct small percentages of the employees' pay to pay them up. The local banks are now working out such a plan.

American Brass, **Chase**, and **Scovill's** have adopted a plan to stop attachments of their employees' pay where sheriff's and other fees are involved. These fees often amount to as much as the bill. The concerns have made arrangements with merchants who threaten attachments, whereby the factory will arrange a meeting between the creditor and employee to make an agreement allowing the factory to deduct a small sum weekly from the employee's pay and apply it to the bill.

Local police stopped a scheme of stealing copper from the **American Brass Company** last month with the arrest of **Anthony Januskas** who had taken over 700 pounds during the past few months.

Patents granted last month included: uniting materials to **William Colina**, assignor to **Scovill**; clock case and dial to **Paul Lux**, assignor to the **Lux Clock Company**; flash light case, **August Mitchell**, assignor to the **Chase**; fluid controlled mechanism assigned to **Waterbury Tool Company**.

Dr. Millicent Pond, director of employment at **Scovill's** has been appointed Connecticut director of the national reemployment service by the federal Department of Labor. It is understood she will receive a nominal salary of \$1 a year.

The **Chase Brass and Copper Company**, selling subsidiary of the **Chase Companies** has acquired the **Erskine Copper Radiator Corporation**, New York, which has been having its products, including sealed radiation, water heaters and other electrical heating appliances, manufactured at the **Waterbury Manufacturing Company** plant of **Chase**. It will be operated as the **Erskine Radiator** division of the **Chase Brass and Copper Company**. **Hugo Hutzel** of this city, in charge of the manufacture of the **Erskine** products at the local plant, will be general manager of the division, and **James D. Erskine**, former president of that company, will be in charge of the sales of the division in the East. —**W. R. B.**

Connecticut Notes

September 1, 1933.

NEW BRITAIN.—American Hardware Corporation, Landers, Frary and Clark, and Stanley Works are operating under the wage and hour provisions of the emergency code, but expect that the codes governing their respective concerns, which will be those for electrical appliances, metal fabricators and steel fabricators, will be ready early this month.

Landers, Frary and Clark is planning a new addition to the Ellis Street plant, to be used as a section of the electrical division.

Work on a steel structure for a division of the Stanley Works on Whiting Street is rapidly nearing completion and forges are expected to be installed this month.

E. L. Pritchard, vice-president of the Stanley Works, is a member of the state committee which is organizing Fabricated Metal Products Federation. **HARTFORD.**—About 3,000 workers of the Arrow-Hart and Hegeman Company, division of Colt's Firearms, the Hart Manufacturing Company and the Wiremold Company, will be affected by the electrical appliance code which is now nearing completion and is expected to be adopted this month.

Charles B. Cook, vice-president of the Royal Typewriter Company, announces that the working force has been increased over 200 the past month, besides about the same number the month before. Practically all were former employees of the company.

The Underwood Elliott Fisher Company reports a net income for the first six months of the year of \$300,102, comparing with a net loss of \$145,687 in the same period last year.

BRIDGEPORT.—The average weekly payroll in July in the plants in this city was \$531,442, compared with \$487,366 in June and \$486,122 in July, 1932.

C. K. Davis, president and general manager of the Remington Arms Company, announces the purchase of the Chamberlain Cartridge and Target Company of Findlay. It will continue to operate there, but the sales will be handled through the local office of the Arms Company.

The Bullard Company reports for the six months ending June 30, a net loss of \$236,123, compared with a loss in the first half of 1932 of \$272,801 and a loss in the same period in 1931 of \$172,732.

BRISTOL.—Fuller Barnes, chairman of the board of the Fuller Barnes Company, is a member of the state committee which is organizing the Fabricated Metal Products Federation.

Wallace Barnes Company and Dunbar Brothers Company announce that they have joined with the spring makers in submitting a code under the NRA. They are operating on a 40 hour week and have increased wages.

TORRINGTON.—Patrick J. Fitzgerald, assignor to the Fitzgerald Manufacturing Company, has received a pat-

ent on a beater construction and on a separable beater for mixing devices.

TERRYVILLE.—Eagle Lock Company shows for the year ending July 1, a surplus of \$845,386, a decrease of \$296,835 from the previous year.

SOUTHINGTON.—Edward G. Hackbarth, assistant to the president, and Dewey S. Blakeslee, president, of the Blakeslee Drop Forge Company, were elected to the board of directors of Peck, Stow and Wilcox Company, last month, succeeding Otto J. Blank of Plantsville and William Marlatt of Cleveland, O. It was voted to reduce the capital stock from \$2,000,000 to \$800,000 by reducing the par value from \$25 to \$10. It was said the purpose is to make it possible to pay a dividend. It was voted that the 1,327 shares owned by the corporation be offered on a pro rata basis to the stockholders and employees.

WINSTED.—For the first time since 1929 a carload of enamel wire weighing 33,000 pounds was shipped from the local freight station on one day last month. The shipment was made by the Winsted Insulated Wire Company, which is operating three 8-hour shifts a day.

CHESIRE.—Cheshire Ball and Socket Company has increased wages 10% and adopted the 40 hour week. The increase applies to piece as well as hourly workers. The concern has about 170 employees, compared with about 100 two months ago.

STAMFORD.—Nearly 1,000 persons have gone back to work in the Yale and Towne Manufacturing Company, Stamford Rolling Mills and Norma Hoffman Bearings Corporation during the last month and a half.

ANSONIA and SEYMOUR.—Leslie Jockmus, manager of the Ansonia Manufacturing Company, and Henry Naylor, general manager of the H. A. Matthews Manufacturing Company of Seymour are members of the state committee which is organizing the Fabricated Metal Products Federation.

GREENWICH.—Electrolux, Inc., which began operations in June with 40 employees, now has 150 on its payroll and has operated at capacity the past month. W. R. B.

Springfield, Mass.

September 1, 1933.

With the general acceptance of the National Recovery Administration program, Western Massachusetts is like most of the rest of the country feeling an improvement in industrial conditions. In line with the ideas of the codes wages are being increased and hours are being shortened to furnish employment for a larger number of persons.

At the Westinghouse plant there has been a great increase in the number of workers on the staff. Since the middle of April the number employed at the factory has risen more than 66 2/3 per cent bringing the total to approximately 3800. Orders indicate that there will be a substantial boom within the next few months and officials at the plant are ex-

tremely optimistic over the outlook.

The United American Bosch reveals that their orders are greatly in excess of the inventory stock and that workers at the plant will be kept busy for some time on what orders have been received within the past few months.

The Van Norman Machine Tool Company is having the best period in several years and indications are that there will be no immediate slump in the volume of business carried on at the local plant; Other smaller machine tool factories in the city are also in good condition as to orders and see no signs of an immediate drop in production. Business is far above par at the Bausch Machine Tool Company due to greatly increased orders from the automotive industry and it appears that there will be no slump for several months to come if there is one at that time.

Reports come from Westfield that orders at the Westfield Manufacturing Company are on the upgrade in spite of the fact that the company has been in the hands of receivers for some time. It is felt that if any form of reorganization can be effected at this time that some action can be taken to put the industry back at a point where it was in 1929 and in the years before. Also from Westfield comes another report that while during the past several months conditions at the Westfield Specialties have not been extremely satisfactory, there has been during the past few weeks a decided pickup in business and leaders at the plant look for no letdown for some time.

Surprising is the condition of the Hampden Brass Company. Conditions at the plant have not been especially good for some time and within the past few weeks comes the reports that a great improvement has been noted.

The Wico Electric Company of West Springfield has reported that with the adoption of the code for their industry they will increase the wages of those persons now employed there and within the next few months hope that they will be able to increase their staff. They have, in line with action taken by other companies also cut the number of working hours at the plant.—G. B. Y.

Providence, Rhode Island

September 1, 1933.

Screw Products Corporation of America, Inc., has been awarded judgment of \$45,627.76 against John A. Arenz, on a contract made in 1926. The decree provides that judgment will be a lien on a patent for a double-thread screw and certain other patent applications covered by the contract, and if the judgment is not paid within forty days, complainant is authorized to hold an auction to satisfy the judgment.

Frederick S. Blackall, Jr., has been elected president and treasurer of Taft-Peirce Manufacturing Company, Woonsocket, manufacturers of precision tools and special machinery.

D. M. Watkins Company has purchased the box setting line formerly

made by **The Jewelers' Supply Company**, and will continue to manufacture the line.

Rothman-Marinelli Corporation, Providence, has been incorporated to manufacture and deal in jewelry, jewelry parts, etc., capital, 100 shares common, no par; incorporators: Charles Rothman, William Marinelli and Marco Marinelli.

Joseph J. Cunningham, Providence attorney, has been appointed temporary receiver for **Providence Products, Inc.**, 710 Eddy Street, on petition of **Abraham G. Debs**, half-owner, creditors and treasurer of the corporation. Bond was fixed at \$2000. The petition states that stockholders have voted to dissolve the corporation.

Manufacturers' Soldering Company, 19 Calendar Street, is conducted by **Gaetano Zagarella**.

A 10% dividend for creditors of the **Waite-Thresher Corporation**, manufacturing jewelers, 10 Abbott Park Place, with claims totalling \$237,441.20 has been authorized by Superior Court. The report of **Horace M. Peck**, secretary of the Manufacturing Jewelers' Board of Trade, as receiver, showed receipts from Feb. 28 to June 10 amounting to \$19,720.88, and disbursements of \$2,183.49, leaving a balance of \$17,537.39.

Art Hadley, president and treasurer, **The Hadley Company**, manufacturing jewelers, sailed from New York recently on what is said to be his eightieth trip across the ocean.

The Acme Tank & Welding Works, Inc., Providence, has been granted a charter.

Crown Hard Enamelling Company, 140 Chestnut Street, is owned and conducted by **E. Vingelli**, 42 Lyman Avenue, Johnston, R. I.

Frank H. Bowie, 41 Mason Avenue, Cranston, has filed ownership statement of **The Jewelry Castings Company**, 911 Pontiac Avenue.

Constantine Manufacturing Company, manufacturing jewelry concern, has been incorporated here; capital, 300 shares common, no par; incorporators: Maurice Constantine, V. A. McGee and M. E. Stayner.

J. M. Carpenter Tap and Die Com-

pany, 17 Newell Avenue, Pawtucket, the oldest firm of its kind in the country, is one of the three companies acquired by **Whitman and Barnes, Inc.**, Chicago tool manufacturers, following ratification plan by stockholders.

Lawrence Fuscarello has been appointed receiver for **Acma Tool and Gauge Company**, 121 Bacon Street, Pawtucket, under bond of \$15,000.

Clarence M. Dunbar of the **Cook-Dunbar-Smith Company**, has been elected president of the Providence Rotary Club.

The second and final dividend of the receivership of **Alfred Vester Sons, Inc.**, amounting to 2.2% has been paid, making a total dividend received by the creditors of 12.2%. The receiver's final account has been allowed by the Superior Court and receivership closed.

Sixteen firms have been admitted to membership in the **Metal Finding Manufacturers' Association**, and the association has joined forces with the **New England Manufacturing Jewelers' and Silversmiths' Association** in formulation of a NRA code for the jewelry and allied industries, and has appointed **Fredrick A. Ballou, Jr.**, of **B. A. Ballou Co., Inc.**, as its representative on the General Council of Jewelry and Allied Industries.

At a meeting of representatives of the jewelry electroplaters of Providence and the Attleboros, held here on July 31 it was voted to form a permanent **Jewelry Electro-Platers' Association**, and a committee consisting of **Russell A. McIntyre**, Hagop Jorjorian and **William Perkins** of Providence; **Oscar Hellman** of North Attleboro; and **W. C. Dobra** of Attleboro with **Nels Berkander** of Providence, ex-officio, was appointed to arrange the organization. **Mark Weisberg** of Providence presided at the meeting. It was voted to subscribe to the NRA code recommended by the **New England Manufacturing Jewelers' and Silversmiths' Association** and **Nels Berkander** was elected chairman of the industry to represent it on the general council of jewelers and silversmiths and allied branches in charge of drafting and supervising the national code.

W. H. M.

Trenton, New Jersey

September 1, 1933.

Seventy-five employees of **Trenton Brass and Machine Company** have returned to work following a short strike. Believing that a 54-hour week was to be replaced by one of 35 hours at the same hourly rate of pay under the NRA code, the men left their work. **William J. Burkert**, secretary-treasurer of the concern, explained that the 35-hour week was not to be enforced for at least a month. The agreement to return to work was reached following a conference with officials.

John A. Roebling's Son Company has put 600 men back to work during the past two months, and wages have been increased \$4 a week due to added hours of work. At present the Roebling mills are operating at about 50% of peak production. Many tons of steel and copper wire are now being sold to hundreds of other plants. The pickup in the automobile tire concerns has resulted in increased business for the Roebling.

Siegfried Roebling, vice president of Roebling's, recently married Miss **Mary Gindhart** of Moorestown, N. J.

New Jersey Incorporations

Forest Mfg. Corp., Newark; electrical products; 2,500 shares.

Fulle's Research Laboratory, Inc., East Orange; 100 shares.

Leonard Spark Plug Co., Inc., Newark; 6,000 shares; spark plugs.

Interstate Bronze Arts, Inc., Newark; bronze products; 100 shares.

Wendel Metal Products Co., Newark; metals; 25 shares.

Helwig Welding, Inc., Irvington; welding; \$100,000.

Hartford Clock Co., Inc., Jersey City; manufacturing clocks; 200 shares.

Electroloy Co., Plainfield; metals; 100 shares. C. A. L.

Central New York

September 1, 1933.

Encouraging reports on activities in the metal trade in Central New York were heard during the past few weeks as production and employment increases were reported. The State Department of Labor report showed that during July both the number of men employed and the pay rolls increased in the Utica territory. Although July is one of the duldest months of the year, the metal group continued increasing its working forces. Throughout the state, in addition to 5,800 persons taken on during May and 5,135 employed during June, nearly 4,000 metal workers were re-employed during July. Brass, copper and aluminum works reported 11.9% employment over June, while firearms, tools and cutlery plants showed an advance of 8.2%. An equally encouraging report was given out by the Industrial Association of Utica which charts employment figures in this area.

Revere Copper and Brass, Inc., Rome, announced that between 600 and 700 additional men have been given employ-

Middle Atlantic States

Newark, New Jersey

September 1, 1933.

The **RCA Radiotron** plant at **Harrison, N. J.**, is running full time in production of parts for automobile radio receiving sets.

The Harrison plant of the **General Cable Corporation**, 720 Lexington Avenue, New York, has been leased by the **Benal Warehouse, Inc.**, for a number of years. The plant, one of fourteen owned by the company, comprises four buildings on an area of about 200,000 square feet.

The New Jersey Zinc Company, has filed an appeal with the Sussex County

Board of Taxation for a reduction of \$1,200,000 in the \$2,200,000 assessment on its mine and plant at **Ogdensburg, N. J.** No reason for the cut is given in the appeal. The zinc company asked a reduction of \$450,000 on the Ogdensburg property last year, but it was denied. The company was granted a \$350,000 reduction on its **Franklin, N. J.**, property last year. The assessment on the Franklin mine was reduced \$250,000 in 1931, following a survey showing depletion of the ore supply. The Ogdensburg mine is newer, but it is said the ore is not so good as at Franklin.

C. A. L.

ment under the NRA code. The agreement allows the company to pay a minimum wage 35 cents per hour for unskilled labor, but a 40-cent minimum is being maintained. The readjustment has resulted in three shifts in departments which are working to capacity.

About 200 employees of **Savage Arms Corporation**, Utica, will be benefited by the new working hours and wages established in accordance with the National Recovery Act. The corporation has also sanctioned the organization of a workman's council.

Remington Rand laboratories will be transferred from Stamford, Conn., to Iliion N. Y., the factory management announces. Seven engineers in that department will occupy new quarters on the top floor of one of the Iliion plants. **A. M. Ross** reported increased employment. He added he had no knowledge that the Dalton plant was to be transferred to Iliion, which had been rumored in Central New York. The Dalton plant is in Cincinnati.

Middle Western States

Detroit, Michigan

September 1, 1933.

Industrial conditions in this area continue to show moderate improvement. Production in the nonferrous metal lines is reported considerably in excess of this period in the last two years. Now, with the changes that seem apparent under the N.R.A. movement, an outstanding improvement is anticipated for the fall and winter.

Some hesitancy is still apparent, but with completion of the codes, it is apparent this will soon disappear.

Production of motor cars, on which so much depends, has been steady for several weeks, and only of late has shown a tendency to decline. This was expected, as sales of motor cars usually slow up towards the end of the summer. Activity always has resumed a few weeks later.

Manufacture of refrigeration units is just as pronounced as it was early in the spring. Most of the plants in the Michigan area still have a substantial list of orders ahead.

Nothing outstanding appears in the manufacture of plumbing and steam fitting supplies. Most of the plants engaged in this work are now active in production of automobile accessories and parts.

Manufacturing jewelers continue as inactive as ever, with nothing very promising in sight.

Norge Corporation, manufacturer of refrigerators, reports shipments for the first 27 days of July were above those for the entire second half of 1932. This record, according to **Howard E. Blood**, president, represents actual consumer buying. Distributors have practically no

Fire pumps used by the Civilian Conservation Corps foresters in fighting forest fires are being manufactured by **D. B. Smith and Company**, Utica. The management reports several thousand of these pumps have been sold in various states and to the United States Forest Service. The outfit includes a five gallon tank and a solid brass pump.

Steinhorst Brothers, Utica, who manufacture an extensive line of metal articles, held a family reunion at the Steinhorst camp at Long Lake in the Adirondacks; 58 members of the family were present. **George O. Steinhorst** was elected president of the family organization.

An electric heating unit for percolators has been patented by **Louis V. Lucia** of Rome, N. Y., who turned over the rights of manufacture embracing six features to **Revere Copper and Brass**.

Horrocks-Ibbotson Company, Utica, entertained its salesmen for two days at the annual convention of the staff when the 1934 line was displayed.—E. K. B.

inventories, and their present unfilled orders is taxing the capacity of the Norge plants, Mr. Blood said. "We are in August with the greatest amount of unfilled orders on our books in our history," he added.

Detroit electroplaters are enthusiastic over the fact that the **American Electroplaters' Association** has decided to hold its 1934 convention in Detroit. **H. J. Hansjosten**, president of the Detroit Branch, who presented the invitation, expects 400 or more electroplaters will attend the gathering next June. Detroit has entertained this fine body a number of times, and even at this early date is giving thought to the coming meeting.

Kelvinator Corporation announces it has unfilled orders on hand five times in excess of a year ago. Shipments the first nine months of the company's fiscal year already have run more than 40% ahead of the entire preceding year. July shipments were 330% of the same 1932 month.

Plymouth Motor Car Company produced and shipped 31,000 cars in July, a new high record, and an increase of 73% over July, 1932, and 32.9% over July, 1931, the best previous month.

Chevrolet in the first six months of this year accounted for 43.7% of all truck registrations, compared with 35.8% in the same period of 1932. Chevrolet is maintaining a schedule of 60,000 cars for August.

Ford has a schedule of 50,000 to 60,000 cars for August. **Plymouth** is expected to produce about 60,000, it is announced.

Kalamazoo Stove Company, Kalamazoo, Mich., is spending \$7,000 for plant alterations. F. J. H.

Cleveland, Ohio

September 1, 1933.

A general improvement in manufacturing seems to be under way in this area. Similar reports come from Toledo, Youngstown and Cincinnati. The most encouraging words come from centers having diversified industries, particularly where nonferrous metals are concerned. Many of these concerns are engaged extensively in the production of motor car accessories and parts of refrigeration units.

Plating plants have been gradually stepping up during the last two months, and some are now quite active.

Much attention now is centered on the new National Industrial Recovery movement. Confidence in its success is generally expressed. Ohio manufacturers are backing every movement that will aid in bringing about the desired results.

Willys-Overland, Toledo, it is stated, has placed orders with **Wilson Foundry and Machine Company**, Pontiac, Mich., for 2,000 engines.

A \$100,000 plant is said to be planned for Cleveland by **Keith Dunham Company**, Chicago, for manufacture of oxygen needed by metal industrial plants. F. J. H.

Chicago, Illinois

September 1, 1933.

Adjustments to NRA codes continue to occupy manufacturers of non-ferrous materials and products. Orders are holding up well in many lines and manufacturers are making the most of the welcome situation even though its continuance is still problematical.

Business in the Chicago district is chiefly responsible for an increase at the Indiana Harbor plant of the Youngstown Sheet and Tube Company, where current operations have reached 70 per cent. Tin plate production is an important phase of the output.

Automobile sales were stimulated this month by a big outdoor automobile show, first of its kind in Chicago, in Grant Park near the principal entrance to the World's Fair. Practically all manufacturers were represented in the enterprise which was sponsored by the Chicago Automobile Trade Association.

Refrigerator shipments of the **Grigsby-Grunow Company** for July were seven times those of last year. During July 29,777 radios and refrigerators were shipped by the concern. New products are being planned, including commercial refrigeration and domestic air conditioning plants.

All previous monthly sales records in the 28-year history of the **Diamond T. Motor Car Company**, truck manufacturers, were shattered during July. Five times as many units were sold as in July, 1932, and as early as August 1, the concern had sold 400 more trucks than during all of 1932, according to **E. J. Bush**, vice president.

The Cord Corporation has purchased control of the 15,000,000 New York Shipbuilding Corporation, manufacturers of battleships, cruisers and steamships.

The first copper house in America, built by Pierre Blouke, Chicago architect, is nearing completion near Rome, N. Y. Exterior walls and ceilings are of copper on steel frame construction. Brass is used for all exterior railings. All doors and trims are of hollow metal and all plumbing will be of copper. Lead coating will be used on 75 per cent of the exterior copper walls and the remainder, being plain, will weather into a patina green. The home is for Dr. and Mrs. George C. Reid, who desired a home which would be fireproof and rustproof, their former frame residence having been destroyed by fire.

Two new organizations announced at the recent annual convention of the National Association of Waste Material Dealers at the Hotel Sherman are the Secondary Metals Institute, formed under the auspices of the metals division of the association, and the National Association of Waste Material Producers.—R. G. K.

Pacific States

Los Angeles, Calif.

September 1, 1933.

American Liquid Gas Company, Los Angeles, has received large contracts for gas plants, and will require a large number of metal containers.

Positive Manufacturing Company, 1108 East 103rd Street, is making a line of improved self-gripping gaff hooks for fishing.

Coleman Lamp and Stove Company of Wichita, Kan., with coast headquarters in Los Angeles, is making a new portable gas-burning cook stove.

Pacific Hard Rubber Company, Los Angeles, has expanded production of hard rubber batteries, parts and containers. Company is owned by Stauffer Chemical Company, Los Angeles.

Radiator Specialty Company of Charlotte, N. C., has organized the Golden State Rubber Mills at Los Angeles, to manufacture a new plumbers' tank ball of rubber and metal.

Josam Manufacturing Company, Cleveland, and William Greenberg's Sons, Michigan City, Ind., have organized Josam Pacific Company, to manufacture and distribute plumbing fixtures. Coast establishments are at 1340 East 6th Street, Los Angeles, and 765 Folsom Street, San Francisco.

C. F. Dodge and J. E. Searles has established a mechanical and industrial engineering business at 142 Moss Avenue, Oakland, Calif., and will specialize in metal products fabrication.

Other Pacific Coast Notes

Commercial Shearing and Stamping Company of Youngstown, Ohio, will establish branch factory at San Francisco, with T. A. De la Mare in charge.

Universal Gear Corporation has appointed Haultrain Industrial Chain

Company, 681 Market Street, San Francisco, as distributors for northern Pacific Coast.

B. F. Sturdevant Company, 2530 6th Avenue, Berkeley, Calif., will build a new plant for making ventilating equipment at 9th and Gilman Streets, Berkeley.

Harry Rowe, 4516 Shilshole Avenue, Seattle, Wash., is spending \$2000 on a new pattern shop and foundry.

Natural Hard Metal Corporation, Beverly Hills, Calif., a new concern, is exploiting a newly discovered metal known as "X". It comes directly from an ore, and is said to be harder than any known alloy.

Flexitallic Gasket Company, Camden, N. J., has opened new Pacific Coast headquarters at 540 Sharon Building, San Francisco.

Columbia Steel Company, Torrance, Calif., has completed a new sheet mill.

U. S. Smelting and Refining Company will build the largest lead refinery west of Omaha at Midvale, Utah. It will employ the Parkes process of refining lead, silver, gold ores, etc.

Wells Manufacturing Company, San Francisco, has developed a new zinc-aluminum alloy for various products. Company has a large plant. George F. Wells is the head.

L. W. Aff Machine Works, San Francisco, has developed a new type drum lathe.

Ideal Battery Works, Fresno, Calif., will build a \$15,000 addition to its plant.

Power State Corporation, San Francisco, has been organized by A. F.

Erickson, to manufacture a gas pilot control and other safety equipment.

Dalmo Manufacturing Company, San Francisco, has started manufacture of Kramer flush valves. T. I. Mosely is president. An eastern office has been opened at 600 South Delaware Avenue, Philadelphia, Pa.

J. B. Wise, Inc., of Watertown, N. Y., has opened an office at 312, 9th Avenue, North Seattle, Wash., in charge of J. W. Mitchell. H. S.

Brass Ingot Statistics

On August 1, unfilled orders for brass and bronze ingots and billets on the books of the members of the Non-Ferrous Ingot Metal Institute, Chicago, Ill., amounted to a total of 15,657 net tons, as compared with 16,568 tons July 1.

The combined deliveries of brass and bronze ingots and billets by the members of the Institute for July amounted to 5,601 tons, as compared with 4,973 tons in June.

Average prices per pound received by the Institute members on commercial grades of six principal mixtures of ingot brass during the twenty-eight day period ending August 11, 1933, are as follows, with comparative prices, reported for the period ended July 14:

| | 28 Days Ended | |
|-------------------------|---------------|---------|
| | Aug. 11 | July 14 |
| Commercial 80-10-10 | 10.065c | 9.249c |
| (% Impurities) ... | 8.250c | 7.535c |
| Commercial 78% ... | 8.508c | 7.975c |
| Commercial 81% ... | 8.740c | 7.990c |
| Commercial 83% ... | 9.000c | 8.364c |
| Commercial 85-5-5-5 ... | 7.284c | 6.667c |
| Com. No. 1 yellow ... | | |

Metal Market Review

August 25, 1933.

The metal markets have remained unusually stable during the past month. Some of the prices have not changed since before the beginning of August. Even tin and silver, which are notable for their price gyrations, have been quite steady. On the other hand, business has been fairly good in most lines. This no doubt had a great deal to do with the steady tone of the prices. Another factor was the preparation and filing of codes by the various metal producing industries, with the quite definite expectation in most cases that after the industries were working under stipulated codes, prices would be considerably strengthened and, if not raised, at least maintained at current levels.

Copper—Business was fairly active throughout the month, and prices held steadily on the basis of 9.00c. delivered Connecticut Valley.

There was a feeling in the trade that consumers have lately abandoned their former hand-to-mouth buying policy, and have begun to stock metal. This doubtless reflects the general idea that under the code which the industry has filed with the NRA the price of the metal, will be closely regulated in relation to

cost of production, and that the day of bargains is over. It is thought in some circles that if a quota selling arrangement is effected by the producers, and the selling price based on cost of production, the result may be some advance in over the current levels.

Surplus stocks in July were unofficially reported to have dropped about 60,000 to 65,000 tons, an impressive figure. Indicators were placed at anywhere from 60,000 to 65,000 tons, an impressive figure.

Lead—The price remained unchanged throughout August to date at 4.35c. St. Louis. Business was spurted, with the general tendency to hold off buying by consumers. Early in the month this was attributed to the uncertainties as to how the industry's NRA code would read. After the code was filed and accepted, with some reservations as to the wage scale, and the industry was given its Blue Eagle, a fair amount of business came forth.

Zinc—Prices remained unchanged the first 16 days of the month, at 5.00c. St. Louis for prime western and 5.05c. St. Louis for brass special. Then on August 17 they dropped five points to 4.95c. and 5.00c., respectively; on the 18th to

Gold—The Attorney General has ruled that no gold which has been smelted may be exported from the United States. Gold concentrate and ore may be exported. There has been considerable demand for export licenses on the part of gold producers, due to the present

may help to settle the market as well. Elsewhere in this issue will be found data on the secondary metal industry's code preparations, and also, on page 323 there is a table showing secondary non-ferrous metal production for 1932.

An aluminum industry code, accord-

Among the developments of interest was the decision of the City of Pittsburgh to re-lay the floor of one of its bridges with aluminum alloy, instead of the worn-out wood and steel that has been there. This will reduce the weight and stress so much that the bridge will be safe for a considerable time to come, whereas it would not have been safe to re-lay the old materials. Gar Wood is using Monel metal shafts on his racing boats, with great confidence in its high strength as well as its anti-corrosion properties.

[illegible]

Metal Prices, September 6, 1933

(Import duties and taxes under U. S. Tariff Act of 1930, and Revenue Act of 1932)

NEW METALS

Copper: Lake, 9.125, Electrolytic, 9.00, Casting, 8.75.

Zinc: Prime Western, 4.65. Brass Special, 4.70.

Tin: Straits, 45.37½. Pig, 99%, nominal.

Lead: 4.35. Aluminum, 23.30. Antimony, 6.87½.

Duties: Copper, 4c. lb.; zinc, 1¼c. lb.; tin, free; lead, 2½c. lb.; aluminum, 4c. lb.; antimony, 2c. lb.; nickel, 3c. lb.; quicksilver, 25c. lb.; bismuth, 7½%; cadmium, 15c. lb.; cobalt, free; silver, free; gold, free; platinum, free.

Nickel: Ingot, 35. Shot, 36. Elec., 35. Pellets, 40.

Quicksilver: Flask, 75 lbs., \$65. Bismuth, \$1.20.

Cadmium, 55. Silver, Troy Oz., official price, N. Y., Sept. 7,

37.00.

Gold: oz., Troy, \$20.67. Platinum, oz., Troy, \$33 to \$34.50.

INGOT METALS AND ALLOYS

| | Cents lb. | U. S. Import Duty | Tax* |
|--------------------------------------|---------------|-------------------|----------|
| Brass Ingots, Yellow..... | 7¼to 8½ | None | 4c. lb.¹ |
| Brass Ingots, Red..... | 9 to 11 | do | do |
| Bronze Ingots..... | 10 to 14 | do | do |
| Aluminum Casting Alloys..... | 13 to 22 | 4c. lb. | None |
| Manganese Bronze Castings..... | 20 to 34 | 45% a. v. | 3c. lb.² |
| Manganese Bronze Forgings..... | 26 to 38 | do | do |
| Manganese Bronze Ingots..... | 10½to 15 | do | 4c. lb.¹ |
| Manganese Copper, 30%..... | 11½to 16 | 25% a. v. | 3c. lb.² |
| Monel Metal Shot or Block..... | 28 | do | None |
| Phosphor Bronze Ingots..... | 10½to 12½ | None | 4c. lb.¹ |
| Phosphor Copper, guaranteed 15%..... | 13 to 17 | 3c. lb.² | do |
| Phosphor Copper, guaranteed 10%..... | 12 to 16 | do | do |
| Phosphor Tin, no guarantee..... | 52½to 75 | None | None |
| Silicon Copper, 10%..... | 18 to 30 | 45% a. v. | 4c. lb.¹ |
| Iridium Platinum, 5%..... | \$34.50-36.00 | None | None |
| Iridium Platinum, 10%..... | \$36.00-37.50 | None | None |

*Duty is under U. S. Tariff Act of 1930; tax under Section 60 (7) of Revenue Act of 1932.

¹On copper content. ²On total weight. "a. v." means ad valorem.

OLD METALS

| Dealers' buying prices, whole-sale quantities: | Cents lb. | Duty | U. S. Import Tax |
|--|-----------|-----------|----------------------------------|
| Heavy copper and wire, mixed. | 7¼to 7½ | Free | 4c. per pound on copper content. |
| Light copper..... | 6 to 6¼ | Free | |
| Heavy yellow brass..... | 4 to 4½ | Free | |
| Light brass..... | 3¼to 3½ | Free | |
| No. 1 composition..... | 5¼to 5½ | Free | |
| Composition turnings..... | 4¾to 5 | Free | |
| Heavy soft lead..... | 3½to 3¾ | 2½c. lb. | |
| Old zinc..... | 2½to 2¾ | 1½c. lb. | |
| New zinc clips..... | 3¼to 3½ | 1½c. lb. | |
| Aluminum clips (new, soft)... | 14 to 14½ | 4c. lb. | |
| Scrap aluminum, cast, mixed.. | 7¾to 8¼ | 4c. lb. | |
| Aluminum borings—turnings.. | 5 to 5½ | 4c. lb. | None. |
| No. 1 pewter..... | 25 to 27 | Free | |
| Electrotype or stereotype..... | 3¾to 3¾ | 2½c. lb.* | |
| Nickel anodes..... | 25 to 27 | 10% | |
| Nickel clips, new..... | 27 to 29 | 10% | |
| Monel scrap..... | 10 to 13½ | 10% a. v. | |

*On lead content.

Wrought Metals and Alloys

The following are net BASE PRICES per pound, to which must be added extras for size, shape, small quantity, packing, etc., as shown in manufacturers' price lists, effective August 4, 1933.

COPPER MATERIAL

| | Net base per lb. | Duty* |
|--|------------------|-----------|
| Sheet, hot rolled..... | 17.12½ | 2½c. lb. |
| Bare wire, soft, less than carloads..... | 12.25 | 25% a. v. |
| Seamless tubing..... | 16.62½ | 7c. lb. |

*Each of the above subject to import tax of 4c. lb. in addition to duty, under Revenue Act of 1932.

NICKEL SILVER

Net base prices per lb. (Duty 30% ad valorem.)

| Grade "A" Sheet Metal | Wire and Rod |
|---------------------------|---------------------------|
| 10% Quality..... 23.37½c. | 10% Quality..... 26.25 c. |
| 15% Quality..... 25.50 c. | 15% Quality..... 30.62½c. |
| 18% Quality..... 26.75 c. | 18% Quality..... 33.87½c. |

ALUMINUM SHEET AND COIL

(Duty 7c. per lb.)

| | |
|---|-------|
| Aluminum sheet, 18 ga., base, ton lots, per lb..... | 32.30 |
| Aluminum coils, 24 ga., base price..... | 30.00 |

ROLLED NICKEL SHEET AND ROD

(Duty 25% ad valorem, plus 10% if cold worked.)

Net Base Prices

| | |
|---------------------------|-------------------------------|
| Cold Drawn Rods..... 50c. | Cold Rolled Sheet..... 60c. |
| Hot Rolled Rods..... 45c. | Full Finished Sheet..... 52c. |

MONEL METAL SHEET AND ROD

(Duty 25% ad valorem, plus 10% if cold worked.)

| | |
|-------------------------------|--------------------------------|
| Hot Rolled Rods (base).... 35 | Full Finished Sheets (base) 42 |
| Cold Drawn Rods (base).... 40 | Cold Rolled Sheets (base) 50 |

SILVER SHEET

Rolled sterling silver (September 7) 40.25c. per Troy oz. upward according to quantity. (Duty, 65% ad valorem.)

BRASS AND BRONZE MATERIAL

Net base prices per pound, mill shipments.

| | High Brass | Low Brass | Bronze | Duty | U. S. Import Tax |
|-----------------------|------------|-----------|----------|-----------|--------------------------|
| Sheet..... | 14.75c. | 16.00c. | 16.37½ | 4c. lb. | 4c. lb on copper content |
| Wire..... | 14.75c. | 16.00c. | 16.37½ | 25% | |
| Rod..... | 12.25c. | 15.75c. | 16.12½ | 4c. lb. | |
| Angles, channels..... | 22.75c. | | 24.37½c. | 12c. lb. | |
| Seamless tubing..... | 16.37½c. | | 18.12½c. | 8c. lb. | |
| Open seam tubing..... | 22.75c. | | 24.37½c. | 20% a. v. | No tax. |

TOBIN BRONZE AND MUNTZ METAL

| | Net base prices per pound. | (Duty 4c. lb.; import tax 4c. lb. on copper content.) |
|--|----------------------------|---|
| Tobin Bronze Rod..... | 16.00c. | |
| Muntz or Yellow Rectangular and other sheathing..... | 16.87½c. | |
| Muntz or Yellow Metal Rod..... | 13.25c. | |

ZINC AND LEAD SHEET

| | Cents per lb. | Duty |
|--|---------------|----------|
| Zinc sheet, carload lots, standard sizes and gauges, at mill, less 7 per cent discount.. | 9.50 | 2c. lb. |
| Zinc sheet, full casks (jobbers' price)..... | 9.75 | 2c. lb. |
| Zinc sheet, open casks (jobbers' price).... | 10.50to 10.75 | 2c. lb. |
| Full Lead Sheet (base price)..... | 8.00 | 2½c. lb. |
| Cut Lead Sheet (base price)..... | 8.25 | 2½c. lb. |

BLOCK TIN, PEWTER AND BRITANNIA SHEET

(Duty free)

This list applies to either block tin or No. 1 Britannia Metal Sheet, No. 23 B. & S. Gauge, 18 inches wide or less; prices are all f. o. b. mill:

| | |
|-----------------------|--------------------------------|
| 500 lbs. or over..... | 15c. above N. Y. pig tin price |
| 100 to 500 lbs. | 17c. above N. Y. pig tin price |
| Up to 100 lbs. | 25c. above N. Y. pig tin price |

Lighter gauges command "extras" over the above prices.

Supply Prices, September 1, 1933

ANODES

Prices, except silver, are per lb. f.o.b., shipping point based on purchases 500 lbs. or more, and are subject to changes due to fluctuating metal markets.

| | | | |
|-------------------------------|---------------|--|--------------|
| Copper: Cast | 15¼c. per lb. | Nickel: 90-92% | 43c. per lb. |
| Rolled, sheets, trimmed | 14¼c. per lb. | 95-97% | 44c. per lb. |
| Rolled, oval | 13¼c. per lb. | 99% + cast, 46c.; rolled, depolarized, 47c. | |
| Brass: Cast | 14¼c. per lb. | Silver: Rolled silver anodes .999 fine were quoted Sept. 1, | |
| Zinc: Cast | 9c. per lb. | from 40.25c., per Troy ounce upward, depending upon quantity. | |

WHITE SPANISH FELT POLISHING WHEELS

| Diameter | Thickness | Under 50 lbs. | 50 to 100 lbs. | Over 100 lbs. |
|---------------|-----------|---------------|----------------|---------------|
| 10-12-14 & 16 | 1" to 2" | \$2.95/lb. | \$2.65/lb. | \$2.45/lb. |
| 10-12-14 & 16 | 2 to 3½ | 2.85 | 2.55 | 2.35 |
| 6-8 & over 16 | 1 to 2 | 3.05 | 2.75 | 2.55 |
| 6-8 & over 16 | 2 to 3½ | 3.00 | 2.70 | 2.45 |
| 6 to 24 | Under ½ | 4.25 | 3.95 | 3.75 |
| 6 to 24 | ½ to 1 | 3.95 | 3.65 | 3.45 |
| 6 to 24 | Over 3½ | 3.35 | 3.05 | 2.85 |

| | Any Quantity | | | |
|---------|-----------------|-------------|----------------|--|
| 4 to 6 | Under ½, \$5.00 | ½-1, \$4.85 | 1 to 3, \$4.75 | |
| 1½ to 4 | " 5.55 | " 5.40 | " 5.35 | |
| 1 to ½ | " 5.85 | " 5.70 | " 5.60 | |

Extras: 25c per lb. on wheels, 1 to 6 in. diam., over 3 in. thick.
On grey Mexican wheels deduct 10c. per lb. from above prices.

COTTON BUFFS

Full disc open buffs, per 100 sections when purchased in lots of 100 or less were quoted July 31:

| | |
|---|---------------|
| Sewed Pieced Buffs, per lb., bleached | \$31.50-39.50 |
| 14" 20 ply 84/92 Unbleached | 45.95-56.89 |
| 11" 20 ply 84/92 Unbleached | 32.70-40.47 |
| 14" 20 ply 80/92 Unbleached | 47.70-59.06 |
| 11" 20 ply 80/92 Unbleached | 43.30-53.60 |
| 14" 20 ply 64/68 Unbleached | 63.48-78.53 |
| 11" 20 ply 64/68 Unbleached | 40c. to 1.09 |

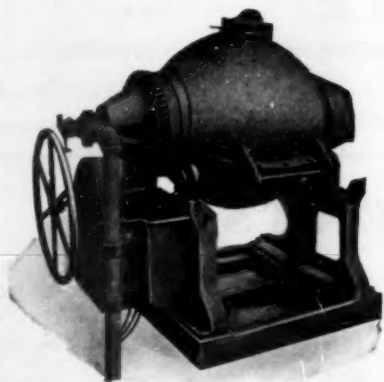
CHEMICALS

These are manufacturers' quantity prices and based on delivery from New York City.

| | | | | | |
|---|------|-----------|---|--|-----------|
| Acetone | lb. | .08-.09 | Lead—Acetate (Sugar of Lead) | lb. | .10-13¼ |
| Acid—Boric (Boracic) granular, 99½% + % ton lots .. | lb. | .04½-.05 | Yellow Oxide (Litharge) | lb. | .12½ |
| Chromic, 75 to 400 lb. drums | lb. | .11½-.17½ | Mercury Bichloride (Corrosive Sublimate) | lb. | \$1.58 |
| Hydrochloric (Muriatic) Tech., 20 deg., carboys .. | lb. | .02 | Methanol, 100% synth., drums | gal. | .41¼ |
| Hydrochloric, C. P., 20 deg., carboys | lb. | .06 | Nickel—Carbonate, dry, bbls. | lb. | .41 |
| Hydrofluoric, 30%, bbls. | lb. | .08-.12 | Chloride, bbls. | lb. | .17-.21 |
| Nitric, 36 deg., carboys | lb. | .06-.06½ | Salts, single, 300 lb. bbls. | lb. | .12-.13 |
| Nitric, 42 deg., carboys | lb. | .07-.08 | Salts, double, 425 lb. bbls. | lb. | .12-.13 |
| Sulphuric, 66 deg., carboys | lb. | .02 | Paraffin | lb. | .05-.06 |
| Alcohol—Butyl | lb. | .095-.11 | Phosphorus—Duty free, according to quantity | lb. | .35-.40 |
| Denatured drums | gal. | .475-.476 | Potash Caustic Electrolytic 88-92% broken, drums .. | lb. | .08-.093 |
| Alum—Lump, barrels | lb. | .03¼-.04 | Potassium—Bichromate, casks (crystals) | lb. | .08 |
| Powdered, barrels | lb. | .03¼-.05 | Carbonate, 96-98% | lb. | .07½ |
| Ammonia, aqua, com'l., 26 deg., drums, carboys .. | lb. | .02¼-.05 | Cyanide, 165 lbs. cases, 94-96% | lb. | .57½ |
| Ammonium—Sulphate, tech., bbls. | lb. | .03¼-.05 | Pumice, ground, bbls. | lb. | .02½ |
| Sulphocyanide, technical crystals | lb. | .42 | Quartz, powdered | ton | \$30.00 |
| Arsenic, white, kegs | lb. | .04½-.05 | Rosin, bbls. | lb. | .04½ |
| Asphaltum | lb. | .35 | Rouge—Nickel, 100 lb. lots | lb. | .25 |
| Benzol, pure | gal. | .58 | Silver and Gold | lb. | .65 |
| Borax, granular, 99½% + %, ton lots | lb. | .02¼-.02¼ | Sal Ammoniac (Ammonium Chloride) in bbls. | lb. | .05-.05¼ |
| Cadmium oxide, 50 to 1,000 lbs. | lb. | .55 | Silver—Chloride, dry, 100 oz. lots .. | } Prices subject to rapid fluctuations of silver market. | |
| Calcium Carbonate (Precipitated Chalk) | lb. | .05¼-.07¼ | Cyanide (fluctuating) | | |
| Carbon Bisulphide, drums | lb. | .06-.12 | Nitrate 100 ounce lots | | |
| Chrome Green, bbls. | lb. | .18¾ | Soda Ash, 58%, bbls. | lb. | .024 |
| Chromic Sulphate | lb. | .33-.55 | Sodium—Cyanide, 96 to 98%, 100 lbs. | lb. | .16½-.22 |
| Copper—Acetate (Verdigris) | lb. | .23 | Beryllium fluoride (2NaF.BeF ₄) | lb. | 4.30-7.00 |
| Carbonate, bbls. | lb. | .16¼-.20 | Hypsulphite, kegs, bbls. | lb. | .03½-.06½ |
| Cyanide (100 lb. kgs.) | lb. | .39 | Metasilicate, granular, bbls. | lb. | 3.55-3.70 |
| Sulphate, bbls. | lb. | 4.10 | Nitrate, tech., bbls. | lb. | .03¼-.07 |
| Cream of Tartar Crystals (Potassium Bitartrate) .. | lb. | .20¼-.20½ | Phosphate, tech., bbls. | lb. | .03¼ |
| Crocus | lb. | .15 | Silicate (Water Glass), bbls. | lb. | .01½ |
| Dextrin | lb. | .05-.08 | Stannate, fluctuating | lb. | .35 |
| Emery Flour | lb. | .06 | Sulphocyanide | lb. | .30-.45 |
| Flint, powdered | ton | \$30.00 | Sulphur (Brimstone), bbls. | lb. | .02 |
| Fluorspar, bags | lb. | .03½ | Tin Chloride, fluctuating, 100 lb. kegs | lb. | .36½ |
| Gold Chloride | oz. | \$12-\$14 | Tripoli, powdered | lb. | .03 |
| Gum—Sandarac | lb. | .26 | Wax—Bees, white, ref. bleached | lb. | .60 |
| Shellac | lb. | .32-.34 | Yellow, No. 1 | lb. | .45 |
| Iron Sulphate (Copperas), bbls. | lb. | .01½ | Whiting, Bolted | lb. | .02½-.06 |
| Lacquer Solvents | gal. | .85 | Zinc—Carbonate, bbls. | lb. | .11 |
| | | | Chloride, drums, bbls. | lb. | .07½-.10 |
| | | | Cyanide (100 lb. kegs) | lb. | .38 |
| | | | Sulphate, bbls. | lb. | .03¼ |

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